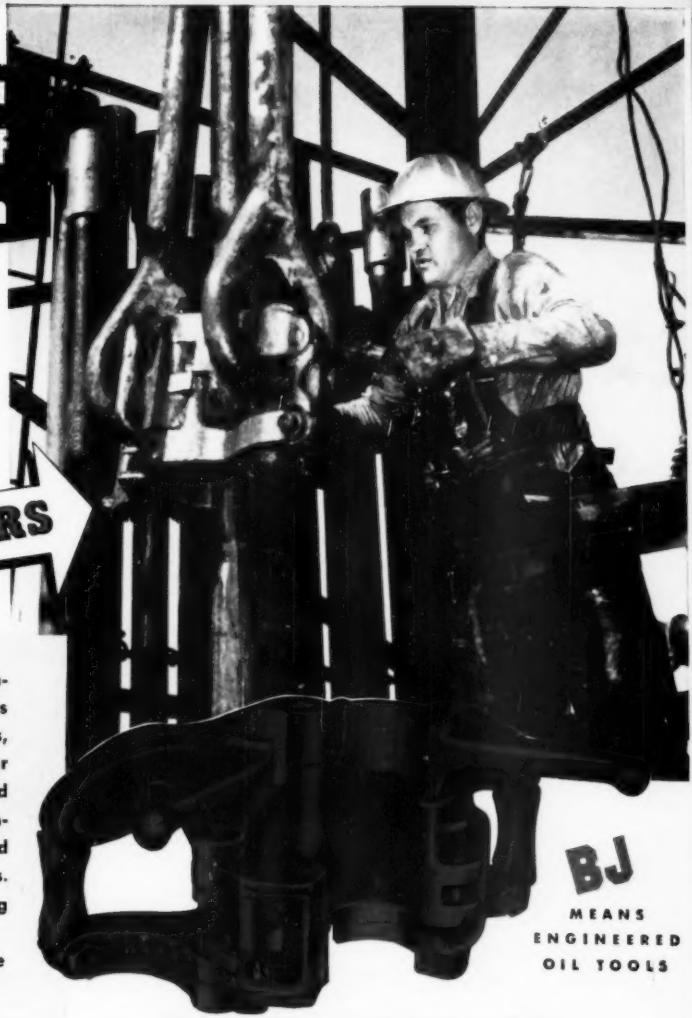
the OIL AND GAS JOURNAL

don't make a monkey out of your derrickman



No matter what kind of a job is being
ne, the derrickman and the crew get going faster
l work better with BJ Elevators. Superior
earch and engineering skills have added "ease
operating features" that men in the field now
nand as standard requirements.

BJ ELEVATORS

Whether you specify the famous BJ "Alphabet" Type Elevators (side door or center latch), Slip Casing Elevators, or other more specialized BJ Elevator types—your derrickman will make faster, smoother round trips with the balanced, easy-operating advantages offered by BJ Elevator design. Engineered with a four to one safety factor. Fewer parts. Constructed for the toughest jobs — handling today's heavy equipment at high speeds

. . . But for the best recommendation, ask the Derrickmen who use them!

BJ MEANS ENGINEERED OIL TOOLS

For complete information on the Industry's most complete line of Elevators, write for the latest BJ Elevator Bulletin. Or refer to your BJ Catalog where complete information is carried.

Byron Jackson Co.

Since 1872

MAIN OFFICE AND PLANT: LOS ANGELES 54, CALIF.

Mid-Continent Office and Plant, Houston 1, Texas
Export Office, New York 17, New York
Stocking Jobbers All Principal Oil Fields

PRICE 50 CENTS TABLE OF CONTENTS PAGE 19 **SEPTEMBER 1, 1949**

Specify

LANE-WELLS GUN PERFORATING

and get 3 Big Advantages

Modern Equipment

Lane-Wells modern field equipment and techniques embody accurate measuring devices, multiple safety features and balanced gun design to get the job done right.

Experienced Operators

Lane-Wells field men and engineers know local field conditions wherever men drill for oil. This experience saves time and money on every job.

Proved Performance

Operators in every producing oil field know from experience that year in and year out Lane-Wells perforating service gets results.

Ask the Lane-Wells Man

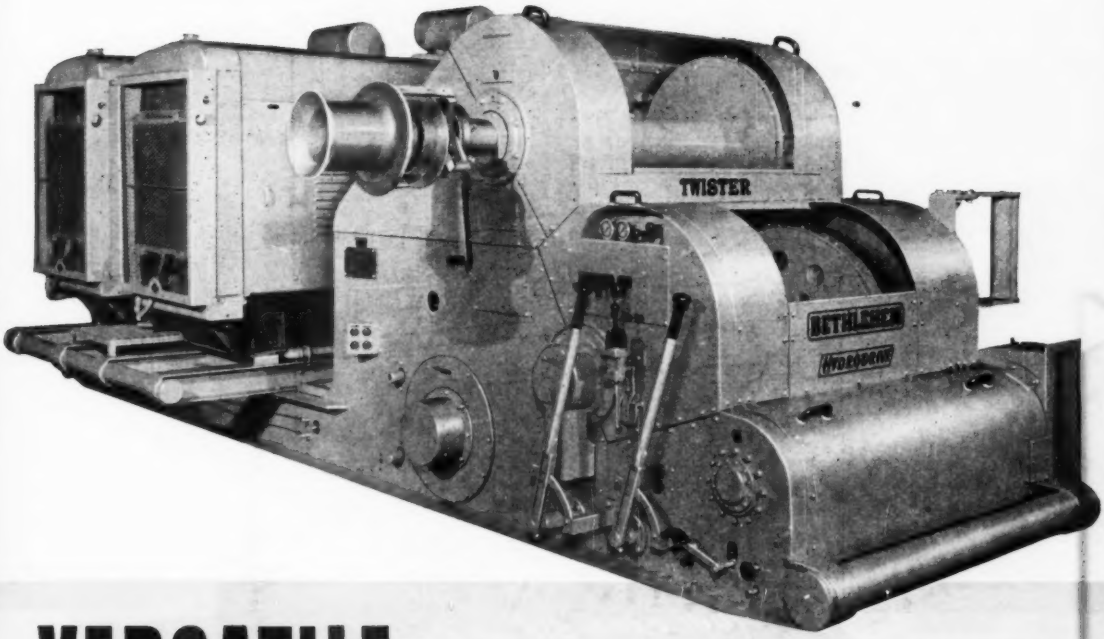
LANE WELLS COMPANY

LOS ANGELES — HOUSTON — OKLAHOMA CITY
GENERAL OFFICES, EXPORT OFFICES & PLANT — 5610 SO. SOTO ST., LOS ANGELES 11, CALIFORNIA

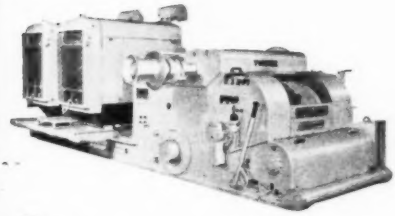
LANE-WELLS SERVICE AND PRODUCTS ARE AVAILABLE THRU PETRO-TECH SERVICE CO. IN VENEZUELA

AG-209

THE BETHLEHEM *HYDRODRIVE* TWISTER



VERSATILE...*and satin-smooth*



For drilling depths ranging from 5,000 to 7,000 ft, and for deepest workover jobs, we spotlight the Twister—give it the full beam with enthusiasm. This is a rig equipped with the smoothest, most shock-free hydraulic drive we have ever offered; a rig completely air-controlled, and so simple to run that the driller can master it in no time at all.

Its smooth flow of power reduces maintenance on clutches, shafts, sprockets, chains, and other moving parts. Shock-loading of drill pipe and other working tools is virtually impossible.

Hydraulic torque-converter drive makes available an infinite number of speeds on the rotary table—and, of course, a full range of drum speeds without constant shifting.

The Twister has many talents. So responsive is the power, so thoroughly under control, that drilling is made easier; workover jobs speeded up. And you should see the gentle way it raises and lowers those portable masts!

Out in the field, where Twisters have been in service for more than a year, there are some mighty pleased owners. It will be worth your while to investigate the reasons.

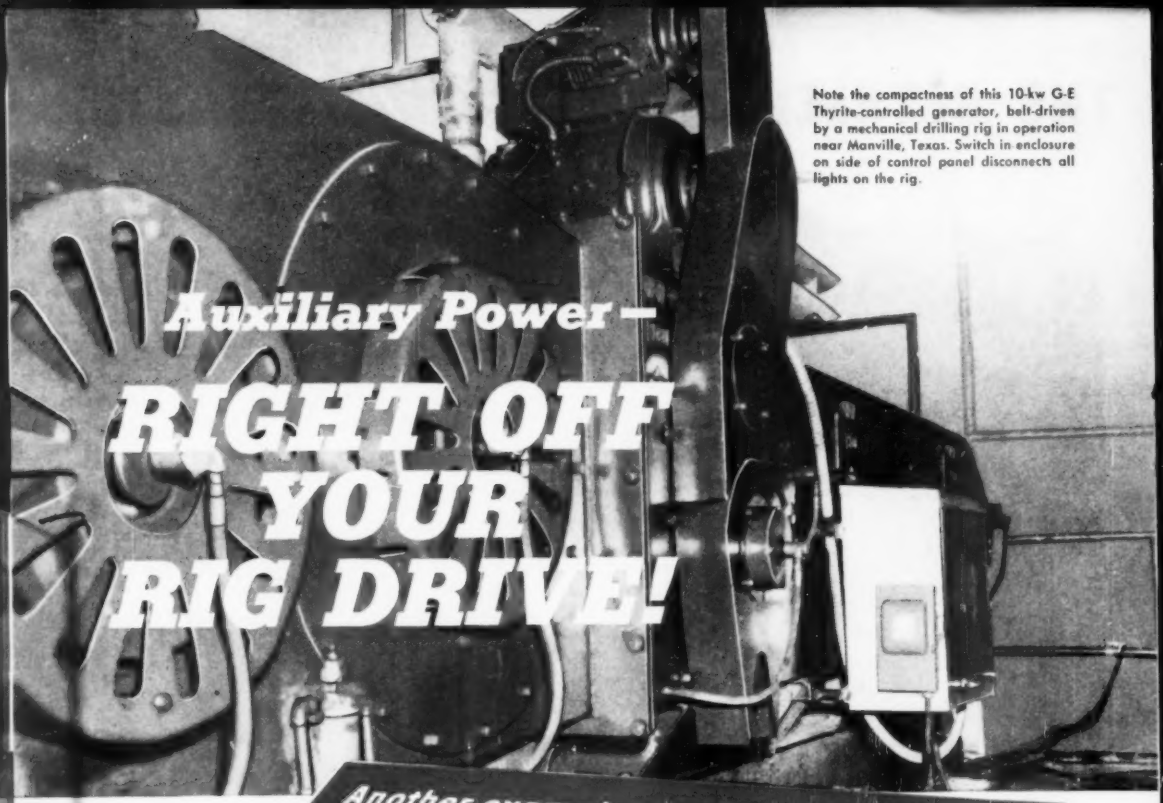
BETHLEHEM SUPPLY COMPANY

General Offices: 21 E. Second Street, Tulsa, Okla.

Subsidiary of Bethlehem Steel Corporation

On the Pacific Coast Bethlehem Oil-Field Equipment is sold by Bethlehem Supply Company of California

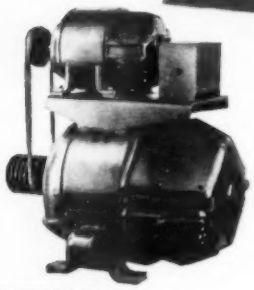
BETHLEHEM STEEL



Note the compactness of this 10-kw G-E Thyrite-controlled generator, belt-driven by a mechanical drilling rig in operation near Manville, Texas. Switch in enclosure on side of control panel disconnects all lights on the rig.

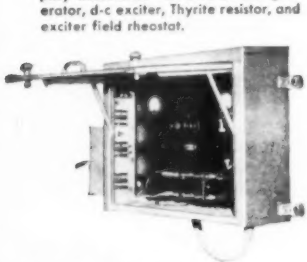
Auxiliary Power — RIGHT OFF YOUR RIG DRIVE!

Another example of General Electric oil field electrification!



SIMPLE INSTALLATION!

A G-E Thyrite-controlled d-c generator—completely factory-assembled to simplify installation—consists of d-c generator, d-c exciter, Thyrite resistor, and exciter field rheostat.



ACCURATE ADJUSTMENT!

An exciter field rheostat, like the one shown in this typical control panel, accurately adjusts the generator's output voltage. Suitable panels can be supplied on request.

Yes, here's a simpler, less expensive way to provide the auxiliary electric power you need for lights and small motors. Drive a generator directly from your main rotary rig engines instead of adding an auxiliary engine.

How? Just belt a G-E Thyrite-controlled d-c generator to your main drilling engine. You'll get dependable, constant-voltage power direct from a variable-speed source. And you can cut out the cost of buying, operating and maintaining an extra engine. No voltage regulator is needed, either, with this self-regulated generator.

Output voltage is kept constant within plus or minus four per cent over a 4:1 speed range which amply covers the full extent of main-engine speed variations. Voltage correction for a change in load takes only two seconds at low speed, less than a second at top speed. Your nearest G-E office will be glad to supply further information. *Apparatus Department, General Electric Company, Schenectady 5, N. Y.*

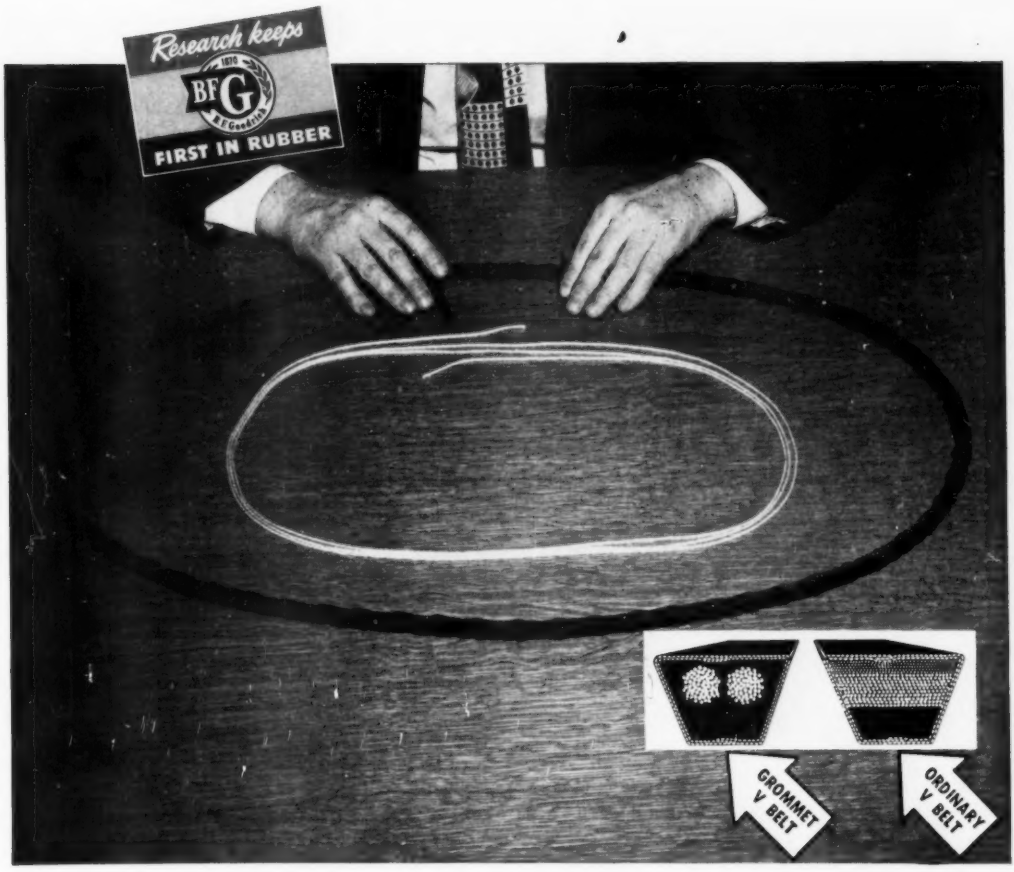
HOW OIL FIELD ELECTRIFICATION CAN CUT YOUR COSTS!

For deeper, faster drilling—for wider use of automatic recovery methods—for more efficient operation of gathering, branch and pipe lines—for scores of other oil production uses—electrification offers you cost-cutting advantages not found in any other type of oil field power. It's all fully, vividly shown in "Lease on the Future", a General Electric full-color and sound motion picture on oil field electrification. A showing will be arranged gladly by your nearest G-E office. Don't miss it!

More Power to America

GENERAL ELECTRIC

661-7



Endless grommet V belts end most cord failures

B. F. Goodrich grommet V belts cut costs 20 to 50%

THAT large loop of cord is a grommet, made by winding heavy cord on itself to form an endless loop. It is one of the twin grommets that make up the cord section of a B. F. Goodrich grommet V belt. The small loop, with the two ends showing, is one of the cords that make up the cord section of an ordinary V belt. Most of the failures in ordinary V belts occur in the region where cord ends overlap. Because the cord in a grommet V belt is in effect endless, such failures are eliminated.

Longer life—Elimination of overlapping cord ends, helps grommet V belts last 20 to 50% longer than ordinary V belts. *Concentrated* cord strength is another reason—all the cord in a B. F. Goodrich grommet V belt is in the twin grommets, each of which is placed close to a driving face of the pulley. This insures maximum power delivery, even load distribution, full use of all cord strength.

Better grip—Because a grommet V belt has no stiff, inflexible overlap section, every part of the belt is equally flexible, gives uniform grip, reduces slip. Size for size, grommet V belts give you ⅓ more gripping power, pull heavier loads, with a higher safety factor. Less heat is generated, cord and adhesion failures are reduced.

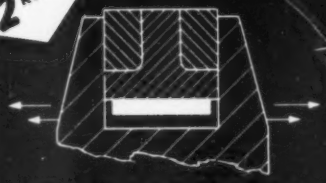
No other V belt is a grommet V belt! Twin grommet construction is an exclusive B. F. Goodrich feature—no other V belt has it. Grommet construction is protected by U. S. Patent No. 2,233,294. (Now available in D and E sizes only.) To make sure you get genuine grommet V belts, see your local B. F. Goodrich distributor. *The B. F. Goodrich Company, Industrial and General Products Division, Akron, Ohio.*

Grommet V Belts BY

B.F.Goodrich

GUN IRON PISTON RINGS

DOUBLE SEALING ACTION DOES THE WORK OF 2 RINGS



SEALS IN BOTH DIRECTIONS

HUNT • SPILLER

Double-Acting

PISTON RING

FOR AIR PUMP AND COMPRESSOR PISTONS

OTHER RINGS

...and still going!

A railroad company installed Hunt-Spiller double-acting piston rings in each of four pistons in a steam operated air pump (2 pistons for steam – 2 for air). Piston rings were normally replaced every nine to twelve months but the Hunt-Spiller rings, of Gun Iron, are still going strong after eight years. Gun Iron is performing equally well in other types of Hunt-Spiller rings for hundreds of different uses.

What is

GUN IRON?

You'll find all the answers as well as valuable information on other metals and alloys in this interesting metallurgical bulletin. Write for it on your company letterhead. No obligation, of course.

Wherever cast parts must withstand frictional wear, high heat, pressure or impact, Gun Iron excels. During the past 139 years its resistance to these conditions has been proven on thousands of applications in the railroad, marine, diesel, petroleum and metalworking fields. In addition, Gun Iron castings can be relied upon for uniform performance because their physical properties are completely controlled at Hunt-Spiller . . . Gun Iron, and its alloys, are produced in our own air furnaces, cast in our own foundry and when desired, can be completely machined in our manufacturing plant.

If you have cast wearing parts in your product, it will pay you to investigate Gun Iron. Our engineers stand ready to assist you in its application . . . our plant facilities are geared to produce your parts, from raw material to finished part, both accurately and economically.

DESCRIPTIVE BULLETIN AVAILABLE ON H-S DOUBLE-ACTING PISTON RINGS

HUNT-SPILLER GUN IRON • AIR FURNACE PROCESS •

HUNT • SPILLER

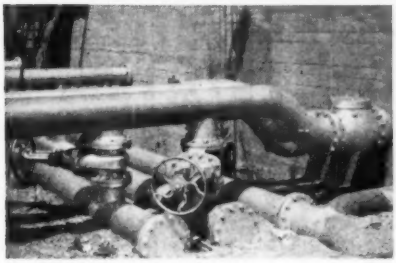
MANUFACTURING CORPORATION

393 DORCHESTER AVENUE • SOUTH BOSTON 27, MASS.

Canadian Representatives: Joseph Robb & Co., Ltd., 4050 Namur St., Montreal 16, P. Q.

For complete piping materials service ...Get everything from CRANE

ONE STANDARD OF QUALITY
SOURCE OF SUPPLY
RESPONSIBILITY

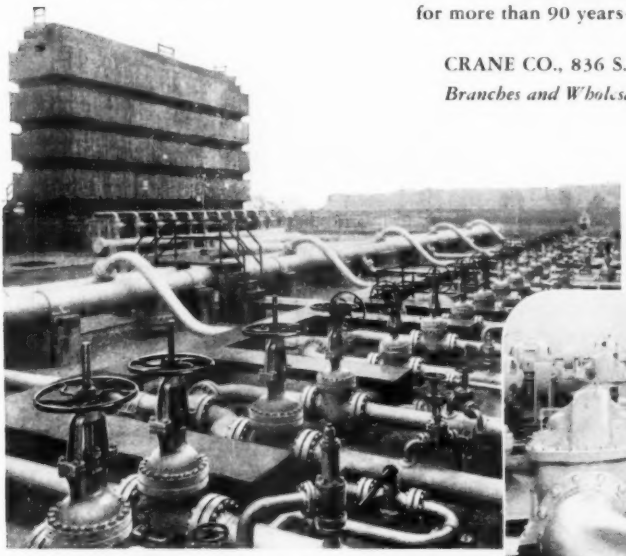


MANIFOLD IN PIPE LINE *station equipped with Crane 125-lb. iron body gate valves, check valves, and flanged fittings.*

Why do pipe line operators and marine transporters rely so extensively on Crane for piping equipment? Merely because the unequaled completeness and quality of the Crane line represent a convenience and economy that cannot be denied. Oil men know that the ability to get everything from **One Source of Supply** . . . whether for crude oil and products lines, or for natural gas lines . . . simplifies all piping procedures.

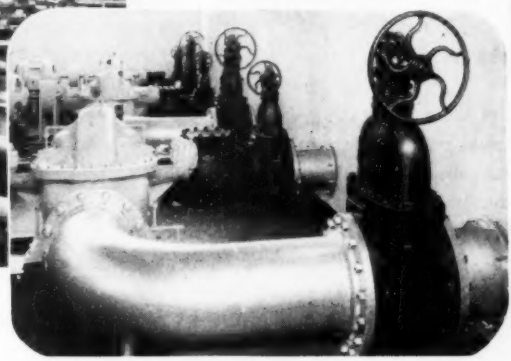
One Responsibility for valves, fittings, pipe and accessories results in better installations, avoids needless delays. No one can give you faster service than Crane, through a network of local Branches and Wholesalers cooperating to serve you—and having direct access to large factory stocks. And for **Highest Quality** in every item, Crane today—as for more than 90 years—stands unsurpassed.

CRANE CO., 836 S. Michigan Ave., Chicago 5, Ill.
Branches and Wholesalers Serving All Industrial Areas



SUCTION AND DISCHARGE *manifold piping to compressor house at booster station. The broad Crane Line includes all valves, fittings, pipe and accessories for installations of this type.*

WATER CIRCULATING PUMPS *to compressor room, featuring Crane bevel gear operated 12 and 16-in. gate valves, and 12-in. check valves.*



EVERYTHING FROM . . .

VALVES
FITTINGS
PIPE

CRANE

PLUMBING
AND
HEATING

FOR EVERY PIPING SYSTEM

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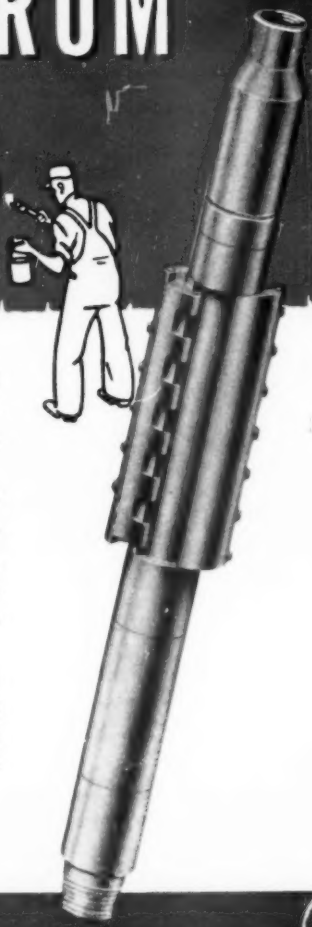
AN ANNOUNCEMENT OF
SPECIAL INTEREST TO
ROCKY MOUNTAIN OPERATORS

H-E REVERSING TOOL SERVICE IS NOW AVAILABLE FROM

S. R. BOWEN CO.



With the S. R. Bowen Company now licensed to run and service H-E Reversing Tools in California and the Rocky Mountain, operators in these areas will have this economical, fast, efficient service available to them on a moment's notice.

H-E Reversing Tools . . . the tool that replaces a string of left hand drill pipe for fishing operations . . . are designed to cause the lower part to rotate to the left, unscrewing stuck drill pipe liners or tubing. All subs and fishing tools arrive with the operator. H-E Reversing Tools reduce the cost of transportation, tool rental and require less rig time per job than any other method. Recovered pipe is undamaged.

H-E Reversing Tools have been used for nearly 30 years on many of the world's record depth wells . . . on countless wells of average depth . . . with outstanding success. Write today for complete mechanical details on the H-E Reversing Tool. It's the oil industry's most successful fishing tool.

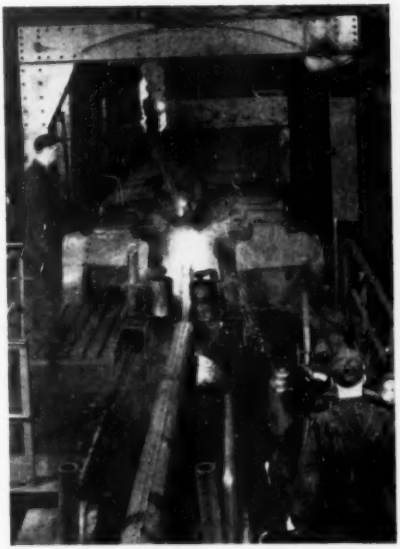
OIL WELL TOOLS · HOUSTON ENGINEERS INC. · HE

HOUSTON ENGINEERS, INC.

P.O. BOX 567 · 1412 ENNIS STREET **HOUSTON, TEXAS**

DEPENDABILITY THROUGH RESEARCH AND ENGINEERING

IN A TEXAS FIELD: running 4300 feet of 7-inch S-80 SMITHway Casing.



IN THE A. O. SMITH PIPE MILL: this automatic flash-welding machine, developed by A.O. Smith research, simultaneously welds SMITHway Casing along its full length.

A.O. Smith Corporation 75th Anniversary 1874 · 1949

SMITH*way* CASING · LINE PIPE

A. O. SMITH CORPORATION

New York 17 • Pittsburgh 19 • Atlanta 3 • Chicago 4 • Tulsa 3 • Dallas 1
Houston 2 • Seattle 1 • Los Angeles 14 • International Division: Milwaukee 1

Good Earth Good Supply Service

Timber, cotton, rice, cattle—petroleum products! Here nature has been especially bountiful with her gifts.

Supply service, too, is plentiful—with Jones & Laughlin Supply stores located throughout the area. Unlike nature's random ways, our stores are carefully located to serve drillers, producers, pipe liners and refiners to their greatest possible convenience. Try this service on your next order.

JONES & LAUGHLIN

SUPPLY COMPANY

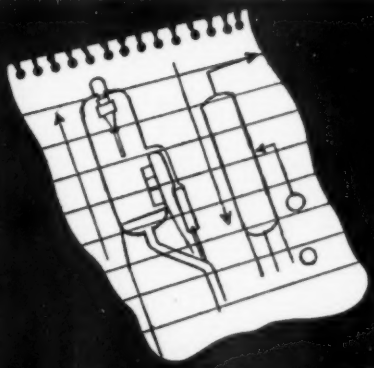
Subsidiary of Jones & Laughlin Steel Corporation

GENERAL OFFICE

TULSA, OKLAHOMA

EXPORT: 230 Park Ave., New York 17, N.Y., U.S.A.

J&L STEEL



FULFILLMENT

Fulfillment of contractual guarantees in plant design and construction is to be expected of any well qualified organization. It becomes a basis for preference as engineering commitments are consistently surpassed. Lummus stands ready for evaluation on whatever scale of values means the most to you: output, completion dates, or long initial runs. But the test that Lummus regards as the best evidence of its ability to fulfill your needs is its record of success in bringing new-process plants from pilot stage to full-scale operation.

teamwork
economy
perspective
resourcefulness

LUMMUS designs and builds with **FULFILLMENT** technique

FULFILLMENT (plant capacity)

A catalytic cracking plant, designed for 5400 B/D, was boosted to 6000 B/D on the 85th day of its initial run. Guaranteed percentage yield of high octane gasoline was also exceeded: 3070 B/D of 10-lb. RVP gasoline against a 2040 B/D guarantee.

FULFILLMENT (initial run)

A long initial run accurately forecasts long-term performance almost every time. This 10,000 B/D catalytic cracking plant was first shut down (for inspection) after 240 days on stream. No major maintenance was necessary. Total turnaround time was some 10,000 manhours.

FULFILLMENT (continuous output)

A continuous processing record for this customer—over 1,200,000 barrels of crude—was established by this Lummus high-pressure cracking unit—on the line for 124 days.

FULFILLMENT (completion schedule)

A polyform gas reversion plant, designed to produce 4000 B/D of high octane gasoline, was completed on a tight 10-month schedule. The acceptance test run met all guarantees. The initial run continued 65 days before shutdown for employee-training purposes.

THE LUMMUS COMPANY
420 Lexington Avenue, New York 17, N. Y.

LUMMUS

CHICAGO—600 South Michigan Avenue, Chicago 5, Ill.
HOUSTON—Mellie Esperson Bldg., Houston 2, Texas

The Lummus Company, Ltd., 525 Oxford St., London, W-1, England

Société Française des Techniques Lummus
39 Rue Cambon, Paris 1er, France

Compañía Anónima Venezolana Lummus—Edificio "Las Gradillas"
Esquina Las Gradillas, Caracas, Venezuela

REMOVE THE CAP . . . REPLACE THE BEAN

FASTER THAN CONVENTIONAL METHODS!

O-C-T PRODUCTION CHOKES
GIVE YOU...
Economy
Speed
Flexibility
Strength
Simplicity
JW CHOKE — The enclosed stem thread and packing unit provides a short, compact adjustable choke.
PC CHOKE—this positive choke accommodates beans from .0156" to ¾" in Type FC 140—beans from .0156" to .3125" in Type FC 142 PV.

In the new JW (Adjustable) Choke and the PC (Positive) Production Choke, O-C-T engineers have incorporated a hand tight flow cap design which materially speeds up the bean replacement operation. This cap holds full body pressure when only hand tight. By simply removing the hand tight flow cap, the bean replacement can be accomplished in a fractional part of the time required by conventional methods.

In addition, this same hand tight flow cap makes the new O-C-T Production Chokes easily and quickly converted from adjustable to positive chokes. Thus, a well may be cleaned with a JW Choke and quickly switched to a PC Choke for steady production.

Added economy is provided in the new O-C-T JW Adjustable Chokes by incorporating an enclosed stem thread, replaceable stem point and an "O" ring bonnet seal unit. The same choke body accommodates the PC Positive Flow Cap and a variety of flow beans.

Check the other features of these new O-C-T Production Chokes. Talk to your O-C-T Representative or write for complete mechanical details.

ASSOCIATION OF WELL HEAD CERTIFIED Equipment MANUFACTURERS

Oil Center Tool Co.

Where WeldOlet is attached to run pipe, it tapers at proper angles, providing for a single bevel groove joint at the crotch section, blending into a V-butt joint at the ear portion.

The quickest — most economical — way to insure FULL PIPE STRENGTH AT BRANCH CONNECTIONS

WeldOlets*, with outlet sizes from ⅛" to 24", both straight and reducing, need no additional reinforcement to establish and fully maintain original strength on ASTM A-106 Seamless Steel Grade A Pipe, as set forth in Code for Pressure Piping, American Standards Association, B31.1-1942, and Supp. No. 2, B31.1b-1947. WeldOlet welding fittings provide the quickest, most economical, most *satisfactory* method of obtaining *full pipe strength* at branch connections. For detailed engineering reference data, write for Catalog W-2.

BONNEY FORGE & TOOL WORKS

FORGED FITTINGS DIVISION • 366 GREEN STREET • ALLENTOWN, PENNA.
Authorized Canadian Distributor: Sterling Steel Co., Ltd., 20 Temperance St., Toronto 1, Canada
MANUFACTURERS OF FAMOUS BONNEY TOOLS

Fig. 1—Cut-away view of reducing size WeldOlet with welding outlet in place. The external rib and wide bases or footings of WeldOlets* eliminate the need for *extra supports* to take care of bending or vibrational stresses at crotch section, the point of greatest stress.

Fig. 2—Note blending of ear portion of welding fitting to run pipe. Extension of weld metal below inside scarfed portion of pipe insures all sections of joint greater than pipe wall thickness.

WELDOLETS

*Trade Mark Reg. U.S. Pat. Off. Pat. in U.S. & Foreign Countries

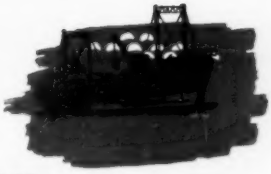
FOR WELDED BRANCH PIPE OUTLETS

When you want Bonney Welding Outlets, ask for WeldOlets*

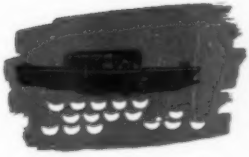
Saving

ON MARINE REPAIRS

AVONDALE



. . . knows that in the long run "Time Saved is Money Saved!" When your equipment needs repair—you want the job done, speedily and with the utmost efficiency! Here, at AVONDALE, a finish-the-job deadline is just as important to us as it is to you. Every man, from engineer to welder, is trained in the job he is performing. Then too—AVONDALE has the proper tools and equipment to make it possible to save on your job. And you, more than anyone else, know that a repair job done well—a repair job done with speed is money saved in the long run. That's why AVONDALE knows that . . .



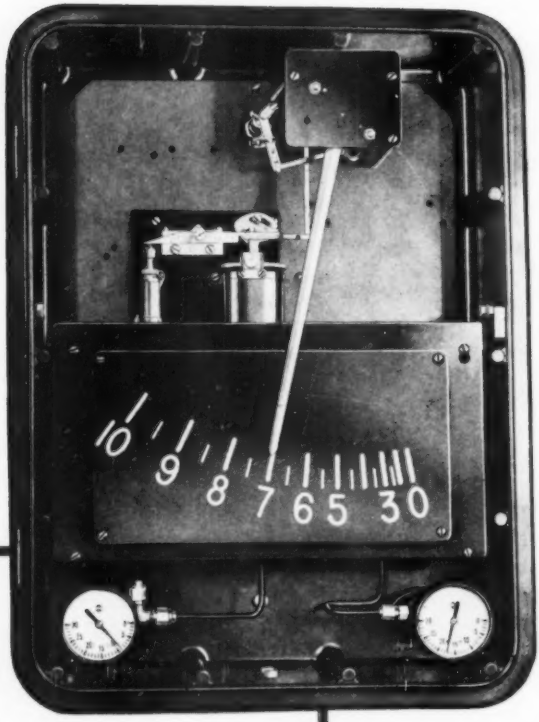
Time Saved is Money Saved

STEEL

AVONDALE MARINE WAYS, INC.

RIVER FRONT, MAILING ADDRESS: NEW ORLEANS DISTRICT WESTWEGO, LOUISIANA

MAIN PLANT: AVONDALE, LA.
QUICK REPAIR PLANT — HARVEY, LA.



1. **NO NEED TO BREAK TUBING CONNECTION** for nozzle adjustment.

2. **INSTRUMENT CAN BE REVERSED** by shifting one link without disturbing other adjustments.

3. **LINKAGE ALIGNMENT MADE EASY IN FIELD** with positioning device.

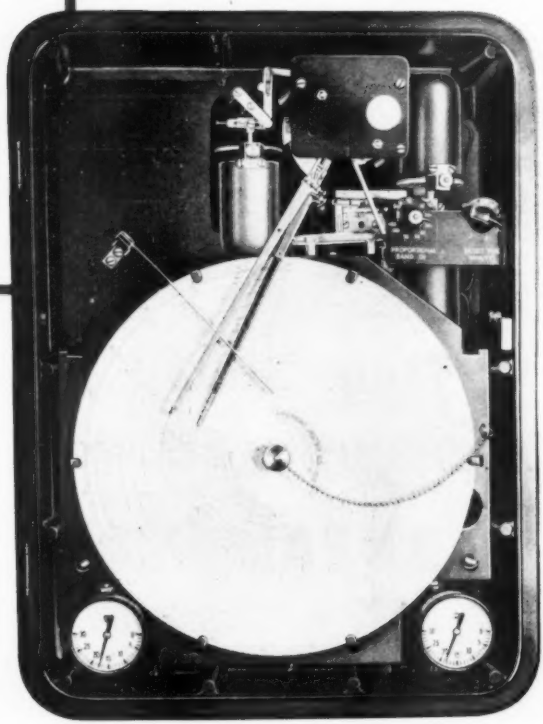
4. **MAXIMUM PROPORTIONAL BAND CHANGES** with minimum output pressure changes.

5. **EASY POSITIONING OF NOZZLE** permits widening of proportional band without disconnecting tubing.

6. **DAMPENING DEVICE IN RELAY** insures smooth operation. Primary orifice in relay is self-cleaning.

SERIES A-88

PNEUMATIC TRANSMITTER AND CONTROLLER



The eight outstanding features of the new American Meter Company Series A-88 pneumatic Transmitter and Controller point to just one all-important accomplishment—the solution to numerous servicing and maintenance problems in the control of flow, pressure, liquid level and specific gravity.

7. RESET VALVE IS SPRING-CLOSING and hermetically sealed with bellows. It is calibrated according to time.

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JOURNALLY Speaking

Running Start

THE oil-producing industry is 90 years old, but the oil-refining industry is 100 years old.

That's just a sample of the contradictions, incongruities, and paradoxes of this amazing and confusing oil business.

For a decade before Drake drilled the first oil well there was quite an industry refining illuminating oil from coal. The process and the market were well established by the time petroleum came along and showed it would make better "coal oil" than coal.

In spite of this running start, refiners are still hard pressed to develop enough new processes and markets to keep ahead of producers.

Reverse Twist

WHILE we're in a historical mood we might comment on the claims of scores of places—New York, Canada, and Russia to mention only three—to have had an oil well before Drake.

The fact is that petroleum from natural seepages was used by primitive and civilized people as far back as recorded history goes. In many places people dug pits and shafts from which they bailed considerable quantities of oil and probably sold for a considerable amount of money or wampum. In other places wells were drilled for brine and produced unwanted oil.

But these weren't oil wells, and they didn't start an industry. Drake was the first man to drill a well for oil, find it, and produce it on a commercial basis. That distinction stands undisputed, despite the local pride of many other places.

In this connection a reader contributes a bit of oil history with a reverse twist about the village of Oil Springs, Ont., which zealously claims to be the birthplace of the oil industry because a farmer dug a pit for oil and found a little a year before Drake drilled. For the next 90 years—that is until 1948—Oil Springs had to import drinking water because all the wells dug in the village produced oil instead of water.

Last year, we are told, a newcomer ignored the tradition and the scoffings of the villagers and drilled for water. And got it. It seems he drilled the other side of the creek which runs through the town and where nobody had thought of drilling before.

There may be a bit of a moral in this; something about fools rushing in. The oil industry was built by just such fools. And if the Oil Springs folk had used as much ingenuity 90 years ago as this newcomer did last year, Oil Springs would have been the birthplace of the oil industry and Drake would have been just another railroad conductor.

Scurry and Hope

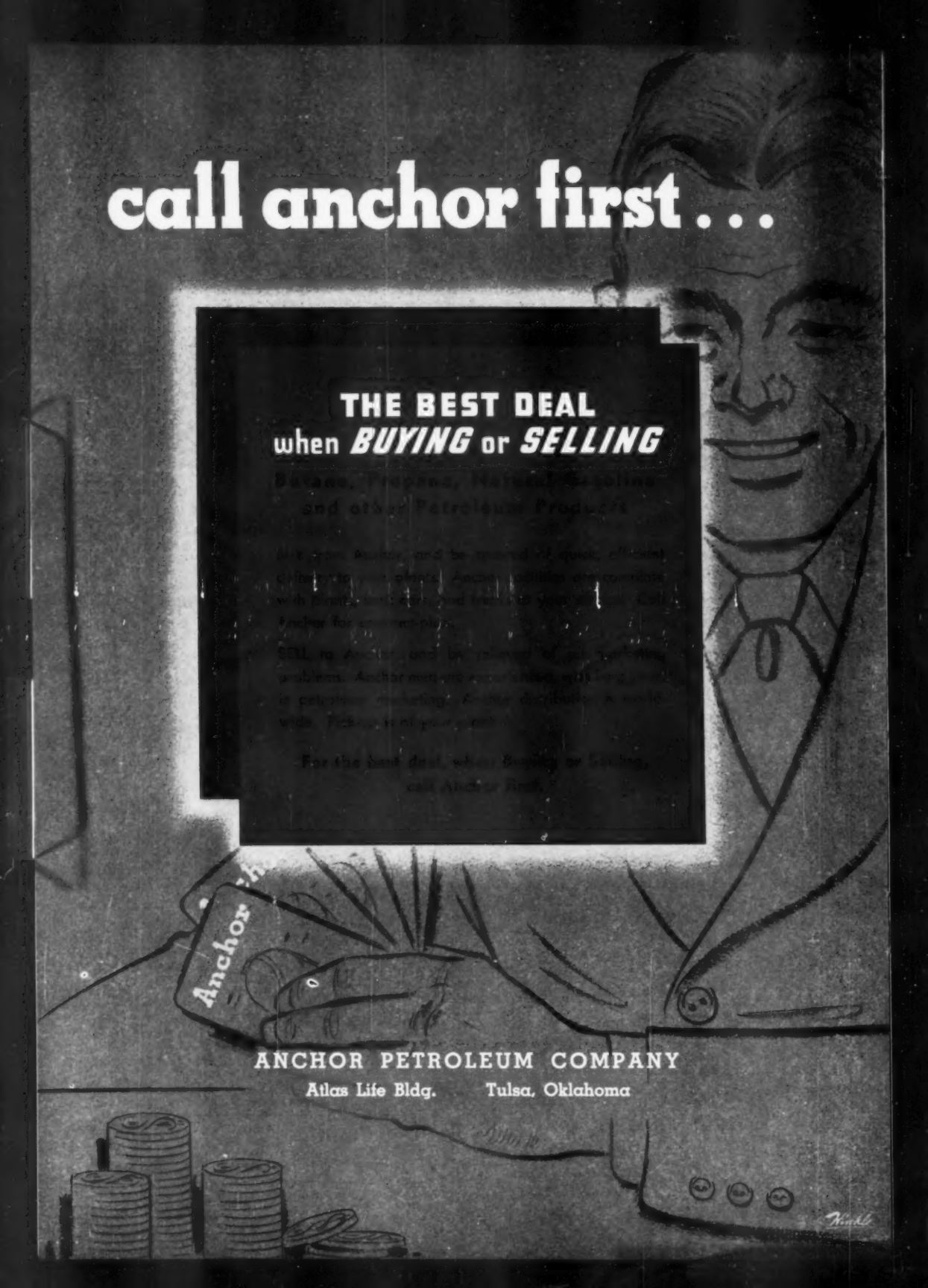
THIS heading is not, as you might infer, a slogan for wildcatters, based on the fact that the successful ones always hustle to get in on hot plays and never lose their optimism.

It refers to all the publicity that Comedian Bob Hope has been getting from the visit to his new oil well in Scurry County, Texas. Bob lived up to his name, all right, because his first venture there was a dry hole. Scurry County discoveries have been providing a lot of excitement for the people out in West Texas, but they were nothing to the field day they had when Hope came out to inspect.

Until recently, genuine Hollywood celebrities were as rare in the oil fields as genuine oil men are in Hollywood, but it may be different soon. Cinemactors Randolph Scott and Jimmy Stewart are now wildcatting in Texas and Utah, Actress Bonita Granville Wrather has just formed Bonita Oil Co., and our spies report that the lobby of the Shamrock Hotel in Houston most any day looks like a convention of film and radio stars.

It is even said that when the word "location" is mentioned in Hollywood it's hard to tell whether the speaker is going to shoot a picture or stake a wildcat.

—Henry D. Ralph



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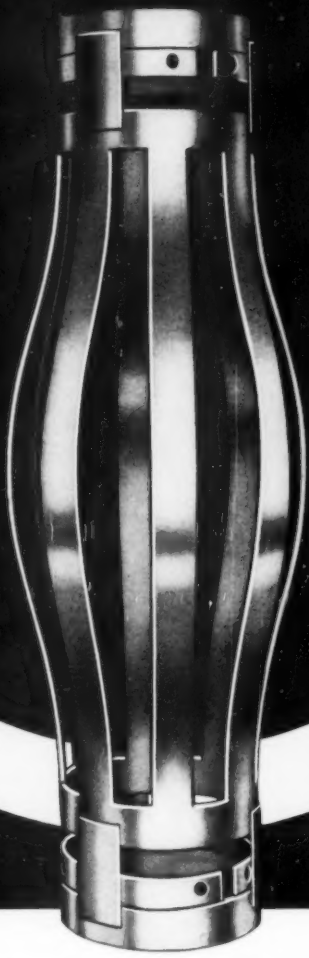

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THE OIL AND GAS JOURNAL

Residual Fuel Oil

REFINERS need to make a careful analysis of the residual-fuel-oil situation in their marketing areas as a guide to future plant operations. There has been scattered improvement in both the statistical and price position of the product in recent weeks, but percentage returns in relation to the total refinery realization are still generally below prewar levels.

Product pipe lines have greatly widened the marketing territories for gasoline and other overhead products, but so far are not adaptable to heavy fuels. This means that except in the coastal areas and along the navigable rivers refiners must depend on costly rail shipment for their fuel oil which normally restricts sales to a few hundred miles from their plants.

The point here is that, except within narrow limits, a shortage of fuel oil in one area offers no relief for a surplus in another. For example, fuel oil in the Mid-Continent district dropped this year to 90 cents per barrel or less in spot sales. Operators were asked why they didn't ship to the East Coast where No. 6 fuel at the time was still bringing about $2. But the rail cost from Oklahoma or Kansas was $2.64. A combination rate from the Mid-Continent to the Gulf Coast by rail and then by tanker to the East Coast is lower, and some distress shipments at exceptionally low prices have been made, but this movement cannot be considered competitive.

The fuel-oil output of Gulf Coast and East Coast refineries is not sufficient to supply Atlantic seaboard demands. No inland refinery group is in a position to make up the deficit. Because of this situation importers insist that the shipments to East Coast points, averaging 165,000 bbl. daily the first 6 months this year, did not replace domestic supplies but were supplementary shipments not available except from foreign sources.

It is pointed out in regard to domestic fuel-oil markets everywhere that if the oil industry is to retain its customers it must guarantee reasonably stable prices which do not penalize the user who also has the choice of coal and natural gas. Indicative of what this means, coal for industrial use is equivalent to $2.15 fuel oil in the New York harbor area where natural gas is also now available in limited quantities for summer consumption by industry at a rate which is equivalent to $1.65 for fuel oil.

Then there is the competition of diesel fuel, particularly in the rail and marine uses. This competition will increase in volume, but in relation to fuel-oil competition will be more important in some areas than others.

Fortunately refiners are not without remedies. The refinery arts have advanced to the point where plants can be operated so there is little or no liquid residual. But manufacturing costs increase as processing is expanded, and it does not follow that a nonresiduum operation is the way out for most operators. What can be done is a matter of manufacturing methods and local market conditions, which will vary from area to area and from plant to plant. Each operator has to determine his own position and act accordingly.

Participants at the sectional meeting on techniques of oil and gas discovery and production at the United Nations resources conference included this group: M. Rodrigues Aguilar, exploration manager, Petroleos Mexicanos; W. H. Godfrey, electronics engineer, Aeromagnetic Survey, Ltd., Toronto; Ford Bartlett, Lockwood, Kessler & Bartlett, Inc., Brooklyn, N. Y.; W. O. Hotchkiss, consulting geologist, New York; Guy I. Warren, vice president, Renwar Oil Corp., Corpus Christi, Tex.; and A. H. Rowan, president, Rowan Oil Co., Fort Worth. Headphones are used at United Nations meetings to provide translations from and to English, French, and Spanish

World Scientists Told:

New Techniques and Equipment Needed

by Dahl M. Duff

LAKE SUCCESS. — Reductions in drilling costs can be expected from new techniques and equipment, but no method that depends on pipe to transmit power can be improved enough to overcome completely the ever-increasing cost of deeper wells.

This belief was expressed by Ivan S. Salnikov, Standard Oil Co. (N. J.), before a sectional meeting last week at the United Nations Scientific Conference on the Conservation and Utilization of Resources.

This situation, Salnikov said, has led to a growing demand for new methods of drilling, culminating in such efforts as the cooperative organization, Drilling Research, Inc. In addition to the turbo-bit, other interesting schemes have been proposed, and some partially tested, including percussion drilling, successive use of explosives, and fusion piercing or burning holes through underground formations. Some show a degree of promise at shallow depths, he added, but the main problem continues to be one of economics.

Salnikov, who is coordinator of petroleum engineering and equipment for the Jersey Standard organization, spoke at a meeting on techniques of oil and gas discovery and production.

Not in Sight

In addition to increased cost at greater depth, present rotary drilling requires larger, heavier, and more expensive rigs, Salnikov said. A drilling method requiring minimum investment, low maintenance cost, only two or three men to operate, and capable of drilling holes to any depth, would be a welcome addition and a suitable substitute present methods.

"Such a method is not yet in sight," he said. "The problem of finding a new drilling method will undoubtedly be difficult and will take a long time. Even so, it will not be more difficult than many of the other problems which we have successfully solved in the last 30 years."

Salnikov pointed out that about 75 per cent of all deep wells in the United States are in the Texas-Louisiana coastal belt in relatively soft formations. "To be economically successful, producing zones in hard formation areas must be of the highest quality to compensate for the high drilling costs," he continued. "Deep drilling costs in hard formations are estimated to be 50 to 150 per cent greater than those in soft formations."

Common practices employed in carrying out drilling completion, cementing, logging, and other operations in Venezuela were dealt with in a paper prepared by the Venezuelan Ministerio de Fomento and presented by Jose Cirigliano, inspector de hidrocarburos in the ministry.

One phase of this paper discussed three-horizon completions which were originated during the war because of the shortage of steel and encouraged by the excellent results and experience gained in the use of dual completions. Cirigliano presented the following table to show economic results based on 49 triple completions of Mene Grande Oil Co., the only company completing such wells.

Type of completion—	Initial prod. (bbl.)	Lb. steel per bbl oil	Well cost	Cost per bbl.
Simple	402	615	$65,000	$162
Double	804	308	65,000	81
Triple	1,206	264	70,000	58

Sponsored by the U.N.'s Economic and Social Council, the multilingual conference is being attended by nearly 600 scientists and technologists from 49 participating nations for the purpose of exchanging information in the general fields of fuels and energy, land, forest, minerals, and wildlife and fish. The sectional meetings of specific application to the petroleum industry ended with the session August 29 on oil chemistry (see story adjoining page).

Offshore Oil Discussed

Mercer H. Parks, Humble Oil & Refining Co., Houston, said the reserves of petroleum underlying the Continental Shelf are undoubtedly great but their reduction to usable oil depends on a number of factors. Among them, he said, are the following:

1. Reduction of development costs by maximum width of well spacing, eliminating wells unnecessary for efficient development.

2. Improvement of all operating techniques and the maintenance of maximum efficient production rates.

3. Maintenance of market prices for petroleum at levels which will support the extraordinarily high costs.

4. Ability of the operators to secure offshore properties of sufficient size and on terms allowing efficient operations.

"Attempts to extend development and production operations to deeper waters and to locations farther from operating bases will usually result in increasing difficulty in making discoverable deposits usable reserves," Parks said. "Physical problems will become more acute and costs will become higher, disadvantages which

must be balanced, at least partially, by improved techniques and better planning if discoverable deposits are to be recovered."

Several comments on both Parks' and Salnikov's papers were made by L. C. Uren, University of California, Berkeley. In combating the great and increasing costs in the industry, he said, as much attention should be given to good management and human efficiency of operations as to pure mechanical improvements.

As for the Continental Shelf, Uren said the importance of directional drilling must not be overlooked. Accurate well surveys, he said, are essential, and electric logging is one of the really outstanding developments in the industry in the last two decades. The success in gravel packing mentioned in the Ministerio de Fomento paper as having been attained in Venezuela should be carefully studied by United States operators, Uren said.

Progress in Petrochemistry Studied

LAKE SUCCESS.—The growing importance of petroleum chemistry as a means of meeting increasing demands for chemical products was emphasized by several technologists August 29 at a session on oil chemistry held as a part of the United Nations Scientific Conference on the Conservation and Utilization of Resources.

Dr. Gustav Egloff, Universal Oil Products Co., Chicago, told the group that more than 5,000 commercial products are now derived from crude oils and that petrochemical plants costing more than $1,000,000,000 are being built in the United States.

Approximately 3,000,000,000 lb. of raw materials for chemicals were produced last year by petroleum chemistry, but, he said, even this huge quantity represents less than 0.5 per cent of annual oil production and has a negligible effect on supply. Less than 10 per cent of the 5,600,000,000,000 cu. ft. of natural gas produced annually is being used in chemical and carbon-black manufacture.

"The materials used for chemicals are principally natural gas and gases from petroleum cracking," Dr. Egloff said. "Utilization of these products for chemicals is a conservation measure as they were formerly burned under boilers and stills."

Advantages offered by some of the various petrochemical processes were discussed in another paper by Leon Jacque, president of the French Petroleum Institute and lecturer at the Ecole Polytechnique in Paris. He also pointed out that consumption of petroleum in the chemical industry remains small in comparison to its use as a source of power and does not work against conservation of resources. On the contrary, he said, selective fractionations and reactions of the basic carbon structures of petroleum relieve the chemical industry of more expensive processes.

Jacque reviewed plans for the development of petrochemical facilities in France and said that the programs which have been started would consume scarcely 2 per cent of the petroleum processed in France. In the case of France, he said, 300,000 to 350,000 tons of petroleum products will be sufficient to produce 150,000 to 200,000 tons of chemical products and at the same time considerably assist other sections of French industry.

Developments in the petrochemical fields in the Netherlands were discussed by Dr. Ir. J. W. H. Uytenbogaart, chief chemist, fuel department, De Bataafsche Petroleum Mij., and professor at the Technical University of Delft. The Netherlands petrochemical industry dates from the first year after the war and the number of products being manufactured is not great, but, he said, as a result of research done before and during the war, it has been possible to start or complete the erection of installations for the manufacture of sodium alkyl sulfates, polyvinyl chloride, and sulfur.

Production of sulfur was started some time ago, and plants for sodium alkyl sulfates and polyvinyl chloride were scheduled to go in operation only recently, Dr. Uytenbogaart said. Excellent detergent properties are obtained in the higher secondary alkyl

(Continued on page 122)

Krug Takes Poke at Oil Men, Plugs Synthetics

LAKE SUCCESS.—Secretary of the Interior J. A. Krug combined some sharp remarks about the petroleum industry with plugs for synthetic-oil development and a solar-energy research project during a discussion August 26 at the United Nations resources conference.

Krug said the petroleum industry had been holding up the development of synthetic-oil manufacture and had succeeded in blocking funds for its development. Nevertheless, he added, the Rifle, Colo., pilot plant is producing about 50 bbl. daily of shale oil.

The secretary was referring to his own Interior Department's synthetics program. The petroleum industry is now spending sizable sums in its own research on synthetic processes and takes the position in general the work can better be handled by private enterprise.

The research to date, Krug told a press conference, indicates that synthetic fuel can be produced at an economical figure. The mere threat of economically manufactured synthetic oil might force the petroleum industry to reduce its prices, he said.

It really doesn't matter much exactly how much reserves of oil remain in the United States, Krug said. The point is that they are being used up at an "unbelievable rate."

The Department of the Interior is now investigating the use of power from the sun and is completing a survey of private research in the field. He said that it would be a good idea for the United States to spend a "few hundred million dollars" to study means of extending the nation's resources and finding new power and fuel sources.

At the United Nations resources conference following the session dealing with petroleum exploration and production: Ivan S. Salnikov, production engineer, Standard Oil Co. (N. J.), New York; Dr. L. C. Uren, University of California, Berkeley; Mercer H. Parks, Humble Oil & Refining Co., Houston; Lester S. Thompson, consulting geologist, Douglaston, N. Y.; and W. Tempelaar-Lietz, reservoir engineer, Shell Oil Co., Inc., Los Angeles

Offshore Drilling Record:

Three Discoveries in One Week

by Leigh S. McCaslin, Jr.

HOUSTON.—In a flurry of activity, offshore operators made three oil discoveries last week in Gulf of Mexico waters off the coast of Louisiana.

These new strikes bring the postwar discovery total to 10 oilers, 4 gas-condensate wells, and 4 gas wells.

Operators making the current strikes are Barnsdall Oil Co. et al, Phillips Petroleum Co. and Kerr-McGee Oil Industries, Inc., and Stanolind Oil & Gas Co.

The Phillips-Kerr-McGee well has promise of being the best oil producer yet found in the Gulf of Mexico. The test was completed for a potential of 934 bbl. of 42.3°-gravity oil daily through a 14/64-in. choke. Production is flowing from casing perforations at 10,390-408 ft. Location of the well is 3 miles offshore in state block 33, West Cameron area, Cameron Parish. The discovery is near the center of a 19,760-acre block and is producing from Miocene sand. Two possible producing zones at lesser depths have not been tested.

The Stanolind discovery is about 10 miles off Cameron Parish and is the company's A-2 well, state lease 1,137.

On a 2-hour drill-stem test it flowed at the rate of 462 bbl. daily through a 3/16-in. choke. Tubing pressure was 1,450 psi, with a gas-oil ratio of 570 to 1. Gravity of the oil is 35°.

The Stanolind well is producing from perforations in a Lower Miocene formation at 8,823-28 ft. Total depth of the hole is 9,044 ft. and tubing is set at 8,792 ft.

Stanolind is now moving its rig over to its adjacent A-1 well which was shut in last June after making gas-condensate through perforations at 8,738-48 ft. The company plans to retest the well for possible completion as an oiler. On its original test it made 40 bbl. of condensate and 3,590 M.c.f. of gas daily.

The third discovery of the week was made by Barnsdall Co. et al in the Breton Sound area offshore from Plaquemines Parish.

On a drill-stem test the Barnsdall well flowed at the rate of 230 bbl. daily through a 5/32-in. top choke. Gas-oil ratio is 331 to 1, and gravity of the crude is 25.1°. Production was through perforations at 5,809-12 ft. The pay-sand interval is from 5,788 to 5,818 ft. Total depth of the well is 9,021 ft. Tubing pressure was 725 psi.

This is the third test drilled by Barnsdall in this area. The first was a gas producer and the second was abandoned as dry. Callery & Hurt and Seaboard Oil Co. have been partners with Barnsdall in these ventures.

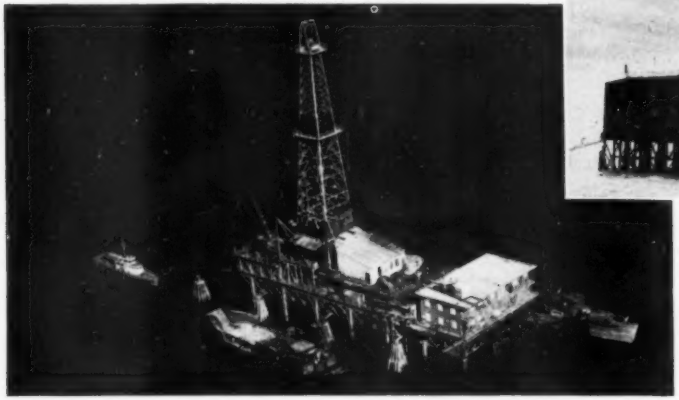
Another interesting offshore development this week was the spudding of a deep test off Texas by Ohio Oil Co. and Melben Oil Co. (Ohio and Benedum-Trees). With Kerr-McGee as contractors on the job, these operators spudded a 12,500-ft. test 6 miles from land off Matagorda County in state lease 31,794. Ohio and Melben have a 50-50 interest in the well which is being drilled on a 6,880-acre block.

POSTWAR DISCOVERIES IN GULF OF MEXICO WATERS
(All have been off the Louisiana coast)

Well, Parish, and Type—	Initial production (Bbl. or cu. ft. per day)
Humble Oil & Refining Co. 1 State Lease 801, Jefferson, oil	878
Humble Oil & Refining Co. 1 State Lease 799, Jefferson, oil	219
Humble Oil & Refining Co. 1 State Lease 804, Jefferson, oil	52
Humble Oil & Refining Co. 1 State Lease 1,027, Terrebonne, oil	456
Kerr-McGee Oil Industries, Inc., et al, S.L. 754, Terrebonne, oil	600
Kerr-McGee-Phillips Pet. Co. State Lease 1,125, Cameron, oil	934
The California Co. 1 State Lease 1,366, La Fourche, oil	255
The California Co. 1 State Lease 1,278, Plaquemines, oil	216
Barnsdall Oil Co. et al 1 State Lease 1,227, Plaquemines, oil (DST)	230
Stanolind Oil & Gas Co. A-2 State Lease 1,137, Cameron, oil (DST)	462
Superior Oil Co. A-1 State Lease 884, Vermilion, gas-cond.	53; 7,024,000
Superior Oil Co. C-1 State Lease 1,106, Vermilion, gas-cond.	12; 7,565,000
Stanolind Oil & Gas Co. 1 State Lease 1,113, Cameron, gas-cond.	40; 3,590,000
Magnolia Petroleum Co. 1 State Lease 838, Iberia, gas-cond.	59; 1,260,000
Barnsdall Oil Co. et al 1 State Lease 1,230, Plaquemines, gas	2,360,000
Kerr-McGee Oil Industries, Inc., 1 State Lease 750, Terrebonne, gas-cond.	69; 3,460,000
Humble Oil & Refining Co. 1 State Lease 1,202, Plaquemines, gas	2,820,000
Magnolia Petroleum Co. 1 State Lease 766, Terrebonne, gas	4,800,000
Pure Oil Co. 1-B State Lease 880, Vermilion, gas	
Magnolia Petroleum Co. 1 State Lease 686, Iberia, gas	

Right: The Barnsdall Oil Co. rig in the Breton Sound area offshore from Plaquemines Parish

Below: Stanolind Oil & Gas Co.'s discovery well about 10 miles off Cameron Parish



this week

GOVERNMENT—Federal judge in Houston injunction suit of shrimp fishermen indirectly supports Texas' claim to 10 1/2-mile offshore jurisdiction. . . . Price Daniel says case may be first court decision on question of title to tidelands. . . . ¶NPC imports committee holds first meeting, appoints statistical body to gather data on imports. . . . ¶Interior Secretary Krug accuses oil industry of blocking development of synthetic-oil production. . . . ¶State Department officials indicate oil may receive only minor consideration in forthcoming talks with British. . . .

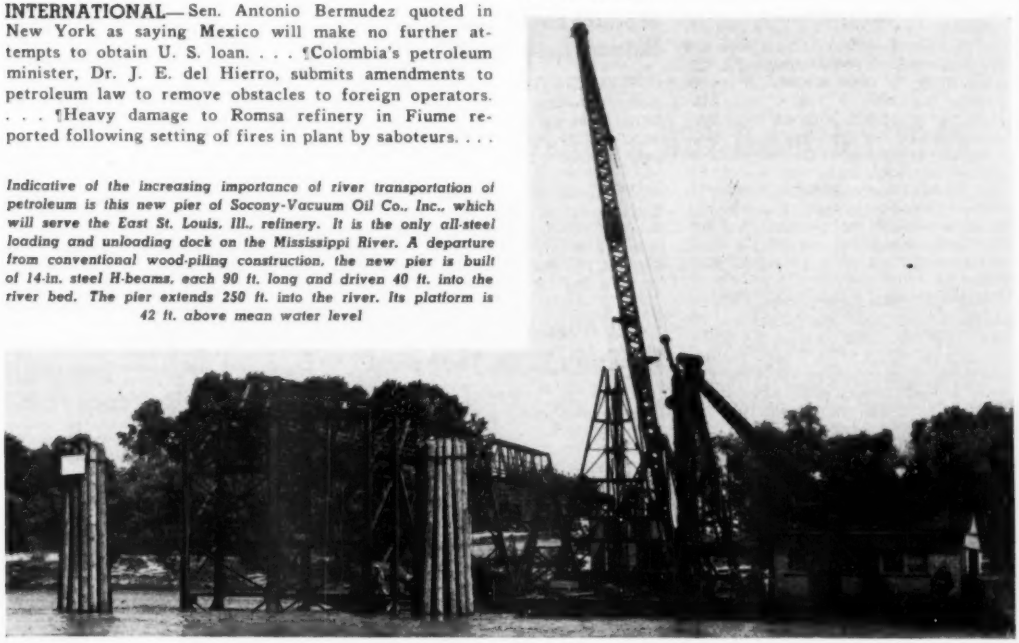
INDUSTRY—Three offshore wells completed as oil producers during past week. . . . Operators bringing in discoveries, all off Louisiana coast, are Barnsdall Oil Co., Stanolind Oil & Gas Co., and Phillips Petroleum Co. and Kerr-McGee Oil Industries, Inc. . . . ¶Shell interests in United States being reorganized. . . . H. S. M. Burns becomes president. . . . ¶Sinclair Oil Corp. announces plans for a 5-year, $250,000,000 project to increase production 50,000 bbl. daily. . . . ¶Carter Oil Co. dedicates new 20,000-bbl. refinery at Billings, Mont. . . . ¶Pan-Am Southern begins operations as fully integrated company.

REFINING—Continental Oil Co.'s expanded facilities at Ponca City, Okla., refinery will go on stream this month, increasing plant's capacity from 33,000 bbl. to 52,500 bbl. daily. . . . ¶Expansion at Esso Standard Oil Co.'s Bayway refinery at Linden, N. J., nearing completion as catalytic cracking unit begins initial operation. . . .

INTERNATIONAL—Sen. Antonio Bermudez quoted in New York as saying Mexico will make no further attempts to obtain U. S. loan. . . . ¶Colombia's petroleum minister, Dr. J. E. del Hierro, submits amendments to petroleum law to remove obstacles to foreign operators. . . . ¶Heavy damage to Romsa refinery in Fiume reported following setting of fires in plant by saboteurs. . . . ¶Contract let for construction of pipe-line outlet for Cerro Manantiales field in Tierra del Fuego. . . . ¶Suderbruch discovery in Germany now reported flowing at rate of 525 bbl. daily. . . .

TRENDS—Residual fuel oil stocks on August 20 were 13,677,000 bbl. above stocks at the end of August last year. . . . Stocks in California were up 18,433,000 bbl. while all other areas were down 4,756,000 bbl. . . . It is reported that 4,000,000 bbl. will be shipped from California to East Coast in spite of transportation costs. . . . ¶In the last 4 weeks, total residual production was off 21 per cent from last year compared with a decrease of 8 per cent in refinery runs. . . . ¶Distillate fuel prices advance on Gulf Coast. . . . Posting by one major supplier is now 7 cents per gallon, the second increase this month. . . .

PIPE LINES—Newly formed Northeastern Gas Transmission Co. asks FPC authority to construct 511-mile natural-gas transmission system in New England. . . . Arranges for supply of gas from Tennessee Gas Transmission Co. and Transcontinental Gas Pipe Line Corp. . . . ¶United Gas Pipe Line Co. seeking authority to construct 105.6 miles of loops in Louisiana. . . . ¶New 40-mile crude line in Michigan is placed in operation. . . . ¶Eastern Natural Gas Co., Richmond, Va., becomes fourth firm to seek authority to construct natural-gas transmission line in Virginia. . . . Three other applications now before FPC. . . .



Indicative of the increasing importance of river transportation of petroleum is this new pier of Socony-Vacuum Oil Co., Inc., which will serve the East St. Louis, Ill., refinery. It is the only all-steel loading and unloading dock on the Mississippi River. A departure from conventional wood-piling construction, the new pier is built of 14-in. steel H-beams, each 90 ft. long and driven 40 ft. into the river bed. The pier extends 250 ft. into the river. Its platform is 42 ft. above mean water level

Sinclair Initiates 5-Year Plan To Boost Output 50,000 Bbl.

A COMPREHENSIVE program to expand crude-oil production expected to increase domestic output at least 50,000 bbl. daily over the next 5 years has been commenced by Sinclair Oil Corp., the company announced August 29.

The program, submitted by Sinclair's producing subsidiaries and approved at a recent board meeting of the parent corporation, may be enlarged later to cover acquisition of additional producing properties as well as greatly accelerated drilling, P. C. Spencer, president, said.

"Sinclair's postwar program to modernize refineries, extend its products pipe lines, and to improve certain marketing facilities has been practically completed at a total cost in excess of $150,000,000," Spencer said. "A substantial increase in crude-oil production has also been accomplished during the same period, but it is now necessary to step up our operation in this field to bring crude production more closely in balance with increasing refinery runs and sales.

"Prior to recent cutbacks, our net crude production was at a rate of about 100,000 bbl. daily. Increased production should materially lower our cost of finished products with corresponding improvement in earnings."

To Cost $250,000,000

The stepped-up production program is estimated to require over-all expenditures of $250,000,000 or more during the next 5 years, and Sinclair has arranged with an insurance company for a long-term 3 per cent loan of $50,000,000 to be available in connection with these operations. Of this amount, only $5,000,000 is to be taken down this year, the balance later. Payments of principal on the new loan are not to commence until the twenty-first year of its 25-year term.

Sinclair's 1948 annual report shows domestic net production last year of 33,670,546 bbl. and foreign, 5,473,330, for a total of 39,143,876 bbl., including total production of the 86½ per cent owned Venezuelan subsidiary. Against this, the company's 1948 refinery runs averaged 258,447 bbl. daily for a year's total of 94,591,482.

The announcement of the new production program said Sinclair has oil leases on more than 5,000,000 acres in the United States of which 225,000 are classified as proved. This affords "an extensive and attractive field" for immediate drilling operations. Locations for more than 400 wells are available on large blocks of acreage already producing, and the program contemplates drilling on semiproved and wildcat areas. It said that the company's resources are adequate for all normal capital requirements with cash and short-term government securities as of June 30 exceeding $132,000,000.

(A biographical sketch of P. C. Spencer appears on page 35 of this issue.)

Kansas, Louisiana Follow Texas in Upping Allowable

Both Kansas and Louisiana have followed Texas in raising daily oil production allowables for the month of September.

Kansas Corporation Commission increased the state's allowable to 260,000 bbl. for September, up 10,000 bbl. daily over August. Louisiana's allowable was increased to 508,854 bbl. daily, up 6,517 bbl. daily over August.

Texas Railroad Commission recently announced a hike in daily allowables of 132,268 bbl. *(The Oil and Gas Journal, August 25, 1949, page 76)* for September, bringing total daily allowable to 2,077,905 bbl. The commission will hold its next hearing September 15 in Austin to determine production quotas for October.

Product Excise Taxes Below Those of 1948

WASHINGTON.—Along with most manufacturers excise taxes, collections from oil and gasoline declined during July, as compared with the corresponding 1948 month, the Treasury reported.

In nearest round numbers, collections on lubricating oils at $4,663,000 were $936,000 under July of 1948.

Gasoline taxes in July of this year yielded $37,630,000, $3,085,000 less than in the 1948 month.

1,400 Attend Barbecue Honoring E. O. Thompson

Ernest O. Thompson, member and former chairman of the Texas Railroad Commission, was honored last week in Amarillo with a stag barbecue attended by 1,400 persons representing 22 states.

The huge crowd, which included Texas' Gov. Allan Shivers, other state and federal officials, and representatives of the oil industry from throughout the Southwest, heard a tribute to Thompson prepared by R. B. Anderson, Vernon, president of the Mid-Continent Oil and Gas Association. In Anderson's absence it was read by Andrew M. Howsley, general counsel for the association.

"Whether it has been a proposed international treaty, national economic policy, a state law, or field regulation," Anderson said, "General Thompson has always been on the alert for and quick to detect any move which would take the regulation of our petroleum resources from the hands of the Texas voters and put it in some faraway bureau, commission, or federal official. Without being cynical, he is wise to the stratagems that develop behind the scenes and the various 'fronts' which seek to undermine our conservation policies."

Thompson told the audience: "I have gone through life trying to collect friends, and my collection—the finest friends any man could have—is on display here tonight."

Program Now Complete for N.P.A. Atlantic City Meet

Final plans for the forty-seventh annual meeting of National Petroleum Association, which convenes in Atlantic City's Traymore Hotel September 14-16, have been completed, W. S. Zehrung, N.P.A. president, will welcome members at the first general session September 14.

Varied topics will be given at the 3-day meeting. The following papers will be delivered:

September 14: "The Oil Industry's Public Relations," by Conger Reynolds, chairman, Oil Industry Information Committee and public relations manager for Standard Oil Co. (Ind.); "The Ascending Cost of Automobile Transportation: Its Implications to the Petroleum Industry," by Alexander Fraser, president, Shell Union Oil Corp.

September 15: "Solvent Dewaxing and Wax Manufacturing from Pennsylvania Grade Crude Oil," by J. M. Hinman, general superintendent, Pennzoil Co.; "Research and Some of the Recent Developments in Specifications for Government Purchases of Petroleum Products," open forum participated in by Maj. Edgar D. Whitley, Munitions Board, Petroleum Committee; Maj. Ray W. Whitson, U. S. Army, Lt. Comdr. Oliver H. Landua, U. S. Navy, and Charles R. Hudson, Wright-Patterson Air Force Base; "Where Is Our Transportation Policy Leading Us?" by Dr. John H. Frederick, professor of transportation, University of Maryland; "Petroleum Transportation Problems — Past and Future," by Harry S. Elkins, traffic attorney, N.P.A.; "Worldwide Lubricating Oil Production Capacity and Its Relation to Demand," by Paul Keyser, Jr., manager, lubricating department, Socony-Vacuum Oil Co., Inc.; "Government and Labor Relations," by Charles M. Brooks, labor relations attorney, The Texas Co.; and "Geographical Pricing, the Basing Point Problem, and the Implications of the Detroit Oil Jobber Case," by Robert E. Freer, member, Federal Trade Commission.

Union, Texaco Buy Lease

BATON ROUGE.—Union Oil Co. of California and The Texas Co. paid the State Mineral Board $25,155 last week for a lease on 578 acres of state land in Iberia and Vermilion parishes.

Administration Insists On Tidelands Control

WASHINGTON. — Administration spokesmen August 29 reaffirmed their demand for complete control of the management and development of submerged coastal lands. They rejected completely a proposed "state compromise" and said they did not approve a "federal compromise" bill.

The net effect of testimony offered by Secretary of the Interior J. A. Krug and Solicitor General Philip B. Perlman was that President Truman would veto any bill that gave the states title or development control of the submerged lands.

Krug told Rep. Ed Gossett, presiding at House judiciary subcommittee hearings on the tidelands question, the question of management should be settled so development could proceed. Krug said although current oil supplies were adequate the country would need between 1,000,000 and 2,000,000 additional barrels of capacity in event of an emergency.

Krug said he spoke with the support of President Truman. He decried any "gift" of the tidelands to states.

Perlman, representing Atty. Gen. J. Howard McGrath, said state claims were based on a "gigantically false premise" that the states had owned the tidelands prior to the California case decision on June 23, 1947. Perlman said the states never had owned the submerged lands, but the Government just had not claimed them.

With the administration's testimony, Gossett ended the 3-day hearings. The record is to be open until October 1 for any additional statements that may be submitted.

Under consideration by the judiciary subcommittee, in addition to a number of quit-claim bills that would give states full title to the submerged lands, are two so-called compromise proposals:

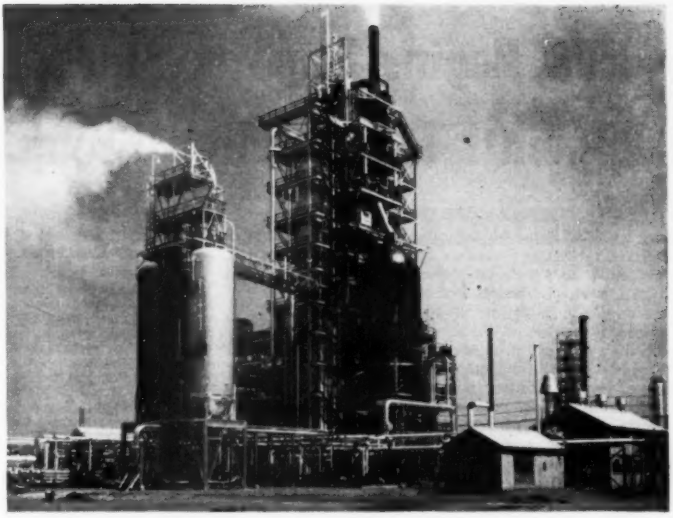
1. A "state" compromise—avoiding the issue of ownership but giving states management and development control as well as major shares in the proceeds from the developments.

2. A "federal" compromise—retaining full ownership, management and control to the federal Government.

American Chemical Society Convention Is September 18

The 116th national meeting of American Chemical Society will convene in Atlantic City, N. J., September 18-23, and one of the main topics to receive special consideration will be security clearance of scientists for secret work on atomic energy.

A variety of subjects will be covered at the convention, including progress in the petroleum field.



Catalytic cracking unit at Carter's new Billings refinery

Carter Dedicates Billings Refinery

CARTER OIL CO. last week dedicated its new 20,000-bbl. refinery in Billings, Mont.

It was described by Carter President Oscar C. Schorp as "but a part of the great program the American oil industry is engaged in to provide greater facilities and new improved products. . . ."

Addressing a banquet group in Billings' Northern Hotel, Schorp said the opening of the new Rocky Mountain refinery presents "another example that a free oil industry operating under the private-enterprise system is the best guarantee for the development of the nation's petroleum resources and of improved products and services to the people of this country."

Principal speaker at the event was Montana Gov. John W. Bonner.

Other speakers included Frank W. Abrams, chairman of the board of Standard Oil Co. (N. J.), and Chester F. Smith, vice president of the parent company.

Construction on the new 20,000-bbl. refinery was begun in December of 1947 and completed this August. It has a storage capacity of 1,400,000 bbl. for crude and products combined. *(For details on the operation of the new refinery, see The Oil and Gas Journal, June 23, page 112).*

Acquired-Lands Bill Dead for 1949

WASHINGTON. — After sputtering life one more day, the proposition to require competitive bidding for oil and gas leases on acquired federal land, came to an end for the present session of Congress.

The House public lands subcommittee, of which Rep. Claire Engle of California is chairman, voted to table or kill for at least the present session the Williams and Allen bills for this purpose.

Prior to tabling these bills, the subcommittee also voted against limiting the application of the competitive bidding to merely Louisiana and Mississippi, a proposition which Engle had indicated as about the only possible action if any competitive bidding bill were voted at all.

The subcommitte listened last to H. J. Duncan, chief of the conservation branch of the U. S. Geological Survey. Duncan came in as a last "rebuttal" witness in favor of the bill. He asserted that competitive bidding will give the independents a "fair share" of the leases, that this practice would yield a greater income to the county governments, and that it would not affect adversely the conservation and development of oil.

Warwick M. Downing, a member of the Interstate Oil Compact Commission, declared that if either of these bills was passed, the majors would be able to outbid the independents for oil leases on the acquired lands.

E. P. LaRue of Mississippi appeared to controvert the claim that Mississippi counties generally wanted this proposition approved. He said that only one county, Franklin County, Mississippi, wanted this passed and that if the subcommittee would allow him, he would bring witnesses from that state to substantiate that information.

NPC Begins Imports Study, Appoints Fact-Finding Group

WASHINGTON.—Within the framework of a factual report, the National Petroleum Council's committee on imports should consider the question of oil imports not only upon the domestic industry, but also should consider world markets, sources of supplies, and national security, it was suggested at the organizational meeting of that committee last week.

The suggestion was made by the committee's own chairman, Frank M. Porter, in his opening remarks. The committee was set up at the request of the secretary of the interior, who on June 14 in a letter to the NPC, suggested that council study not only the problem of petroleum imports, but the problem of providing a substantial domestic reserve productive capacity to be available in the event of a national emergency.

Political Questions Involved

It was indicated that the first work of the import committee will be statistical. The question of how large imports actually are, it was noted, is a subject of considerable dispute. Hence a subcommittee of the import committee will begin to work up a statistical report, which may be completed in a few weeks.

"The questions of imports, as we all must recognize, present many secondary considerations," Porter said. "I doubt the possibility, or at least the practicability, of attempting to appraise the position of our domestic economy or the factors involved in the national security by any yardstick that does not include a consideration of world markets, sources and location of supplies and the international exchange situation with which we are confronted.

"These will naturally involve many political problems. A frank and impartial examination of the impact of this situation upon the United States and our people is the job of this committee. Imports as we know them today are probably not the only problem of the domestic industry. In the near future, British, Canadian, and Mexican oil appear to be certain bidders for American petroleum markets, as well as the foreign markets we have heretofore supplied. The proposed expansion program of the British as revealed to the ECA and the dollar assistance being given to the program by this country necessarily raises serious considerations for the American oil industry," he said.

"How far this committee may want to project its study into these matters is something that will have to be determined as we proceed, but I doubt if they can be ignored," Porter suggested.

Members of the statistical subcommittee are: Howard W. Page, Standard Oil Co. (N. J.), New York, chairman; Fred Sehmann, National Stripper Well Association, Wichita Falls, vice chairman; Kenneth E. Beall, Phillips Petroleum Co., Bartlesville, Okla.; J. W. Boatwright, Standard Oil Co. (Ind.), Chicago; James V. Brown, National Petroleum Council, Washington; Austin E. Cadle, Standard Oil Co. of California, San Francisco; John C. Day, Western Petroleum Refiners Association, Tulsa; Fayette B. Dow, National Petroleum Association, Washington; Stark Fox, Oil Producers Agency of California, Los Angeles; R. J. Gonzalez, Humble Oil & Refining Co., Houston; Henry B. Hilts, Atlantic Coast Oil Conference, Inc., New York; Dene B. Hodges, Shell Oil Co., Inc., New York; Minor S. Jameson, Jr., Independent Petroleum Association of America, Washington; J. P. Jones, Penn-Grade Crude Oil Association, Bradford, Pa.; W. H. Kraft, Honolulu Oil Corp., San Francisco; J. A. Lentz, Continental Oil Co., Denver; E. Madison, The Texas Co., New York; A. J. McIntosh, Socony-Vacuum Oil Co., Inc., New York; W. G. Moore, Gulf Oil Corp., Pittsburgh; and Fred Van Covern, American Petroleum Institute, New York.

Shrimpers Lose Round; Tidelands Claim Upheld

HOUSTON.—The State of Texas emerged victorious this week in the first court skirmish of a fight over shrimping rights—a struggle which may affect the state-federal tidelands controversy over oil.

Suit had been brought by 48 Louisiana shrimp fishermen against the Texas Game, Fish, and Oyster Commission. The shrimpers are challenging the constitutionality of a law passed by the last Texas legislature giving the commission the authority to prorate Texas shrimp by limiting the number of commercial fishing licenses. In this week's action they sought a temporary restraining order, but this was denied by Federal District Judge Allen Hannay.

The tidelands oil fight enters into the suit because the fishermen claim the state has no jurisdiction in Gulf waters beyond the 3-mile limit. Texas claims jurisdiction up to 10½ miles offshore in its fight with the federal Government. This limit is based upon the treaty under which the Republic of Texas joined the United States.

Texas Atty. Gen. Price Daniel commented on the case by saying "this may well be the first court decision directly on the question of title to the Texas tidelands." Daniel was in Washington testifying before a congressional committee on two tidelands bills now before that body. He directed his staff in Austin to fight the shrimp case. J. Chrys Dougherty, head of the attorney general's tidelands staff, and Asst. Atty. Gen. David Wuntch handled the case for the state.

With the refusal to grant a temporary restraining order, Judge Hannay gave notice to Chief Judge Joseph C. Hutcheson, Jr., of the Fifth Circuit Court of Appeals that the suit had been filed. Hutcheson is to name two other judges and will probably hear the case in the near future.

Burns Becomes Head of Shell in Reorganization

H. S. M. BURNS, president of Shell Oil Co., Inc., will become president and operating head of a new company to be formed as a result of the reorganization of the Shell

A. FRASER

H. S. M. BURNS

interests in the United States involving the absorption of the present Shell operating company by Shell Union Oil Corp., a holding concern.

Under the new corporate setup Shell Union will become Shell Oil Co., of which Burns will be the executive head, and Shell Oil Co., Inc., will be dissolved.

Announcement regarding the simplification of the Shell corporate organization was made by Alexander Fraser, president of Shell Union, who will be chairman of the executive committee of the new company effective September 30. George Legh-Jones of the London executive offices of the Shell interests, will become chairman of the board of the new company.

The reorganization program has been under way since the close of the war according to the official announcement and "will call for no staff changes at the operating level and no material change in the official positions of the senior managerial staff." Vice presidents of the two companies will retain their title and position.

Shell Pipe Line Corp. and Shell Chemical Corp. will not be involved in the corporate consolidation. Stockholders of Shell Union will be asked to approve the change in name.

International

WORLD-WIDE OIL DEVELOPMENTS

Amendments to Colombian Oil Law Proposed by Del Hierro

A SERIES of amendments to the Colombian petroleum law have been submitted to the Congress in Bogota by the minister of petroleum, Dr. J. E. del Hierro, in an effort to remove some of the legal obstacles to operations in that country.

The proposed changes provide for two additional magistrates to expedite litigation on private oil rights, remove the ceiling of two concessions per operator, modifies the mandatory drilling requirements, lengthens the exploratory period from 3 to 5 years, and places the maximum area of concessions at 50,000 h. (about 125,000 acres), irrespective of location.

Although the amendments if passed would be of some value in facilitating operations, the feeling is that a more thorough-going revision of legislation affecting the industry in Colombia is needed. Exploratory drilling has fallen off, and several companies have withdrawn. Along with an uncertain geology and a lack of success in many wildcats, it has been pointed out that Colombia confronts the industry with fundamental problems of taxation, labor, and land title difficulties. Most recent company reported closing down its Colombian operations was Phillips Petroleum Co.

De Mares a Question

Operation of the De Mares concession of Tropical Oil Co. when it reverts to the government in August 1951 continues as a major subject of interest in Colombia. Last year, the congress passed a law authorizing an official or semiofficial company in which a minimum of 51 per cent control would be held either by the government or Colombian nationals. None of the major oil companies has indicated willingness to enter the company as a minority partner.

One major problem in this respect lies in the fact that the bylaws and other details of the proposed company have not been announced, so that the value to be placed by the government on its property is not known. Presumably the government would offer the concession as its share in the company with the foreign or Colombian interests providing operating capital.

Tropical's notification that it would reduce its personnel at De Mares by some 450 workers has raised threats of a strike by the oil union. The company now employs about 3,000 persons on the concession, and even further reductions have been indicated as the company tapers off its operations.

The retrenchment program is being debated in the congress and has been made the subject of hearings by the oil committee of the house. The oil union, Fedepetrol, has asked congress to prevent the reductions in personnel, and the minister of petroleum is studying the technical and economic reasons behind the retrenchment.

ANCAP Building Second Topping Unit at LaTeja

Administracion Nacional de Combustibles Alcohol y Portland (ANCAP) is now building a second topping unit at its LaTeja refinery located on the Montevideo Bay, about 5 miles from the city of Montevideo in Uruguay, S. A.

The unit will have a capacity of 9,500 bbl. daily and will include a vacuum unit for the production of asphalt. This phase of the operation will process 750 bbl. daily and will include side cuts for the production of lubricating-oil base stocks.

The refinery at present has a crude-oil distillation capacity of 6,300 bbl. daily and a cracking capacity of 2,200 bbl. daily. The cracking unit has been adapted for the atmospheric distillation of crude oil, and when in operation the refinery can process 15,700 bbl. daily. The construction of a unit for the production of liquefied gas is under consideration.

Loss of Oil Marketing Facilities in China Seen

AMERICAN oil interests appear to be resigning themselves to the loss of their marketing operations in China as a result of the nearly complete conquest of the country by Communists.

Even after the fall of Shanghai earlier this summer, there appeared to be a possibility that some degree of petroleum trade might be continued because of the economic needs of the country. Recent actions of the Communists in backing up exorbitant labor demands in Shanghai have been a major factor to show continued operations are nearly impossible.

Reports are that no petroleum products from the companies formerly marketing in China have entered Shanghai since mid-May.

The two American companies affected are Standard-Vacuum Oil Co. and California Texas Oil Co., Ltd. Shell, the third company marketing in China, is understood to be planning to continue in the country as long as possible. This is in line with the position taken by most other British interests.

Complete loss of the Chinese market would affect about 55,000 bbl. daily of petroleum products, a sizable part of which involves Middle East crude. The Economic Cooperation Administration has been allocating some $50,000,000 a year to meet China's minimum civilian needs, and the Nationalist government has been spending another estimated $25,000,000 for petroleum for the military.

Standard-Vacuum announced recently it was withdrawing from Canton, leaving Chinese employes to look after its interests. Caltex also took its foreign staff out of the southern China city and was understood to have about 35 employes remaining in occupied China who would be evacuated when possible.

Complete investment of the three foreign oil companies in China is estimated to total about $60,000,000. It consists mainly of terminal and distribution facilities at major ocean and river ports.

State Company Sets Up Development Program for Upper Po Valley Area

by Dahl M. Duff

THE government-controlled Italian oil company, Azienda Generale Italiana Petroli, has set up a program costing one billion lire (about $1,775,000) to carry out the development of its new discovery near Cortemaggiore in the Upper Po Valley of northern Italy.

According to reports from Italy, the company is planning a total of approximately 100 wells, presumably either oil or gas. The depth at which oil has been found in the two Cortemaggiore wells thus far is about 1,600 m. (5,250 ft.), and all indications are that the area will be at least a sizable gas field.

The discovery of oil in Cortemaggiore 2 in June created considerable excitement in Italy and quickly became a point in the current political controversy over whether the Italian exploration will be broadened by amendments to the Mining Law opening up the country to private capital.

Enrico Mattei, vice president of AGIP, mentioned the possibility of Italian self-sufficiency in fuel as a result of the recent discoveries, not only of oil but also of additional gas reserves in other Po Valley areas. He pointed out that the successful results had been obtained by a state-controlled organization. A subsequent government announcement somewhat tempered this optimism, stating that an output of perhaps 20,000 bbl. daily might be possible after several years of development.

New Field Reported

AGIP also is said to have made another oil discovery in an area northeast of Parma which has not yet been evaluated. The company is continuing its seismograph work and is planning to study the entire zone between Mantova and Rovigo.

If the recent oil discoveries justify some of the even more modest predictions that have been made, they will mark the first success of any significance in the long effort to find oil in Italy. The gas reserves found in the Po Valley have kept the exploration work alive.

Present potential of the northern Italy gas wells is placed at 500,000 cu. m. (about 14,200,000 cu. ft.) daily, though consumption is limited to about 300,000 cu. m. (10,600,000 cu. ft.) daily by the lack of sufficient gas lines. AGIP is now speeding up the construction of a line between Lodi and Milan to supply a new

AGIP rig operating in Cortemaggiore area

electric generating plant in Milan. A line also is to be built from Lodi to Turin and from Lodi to Genoa with a daily capacity of 2,000,000 cu. m. (70,500,000 cu. ft.) daily.

The high cost of other fuels—coal $40 a ton and rationed gasoline 77 cents a gallon—has given an incentive for the development of the gas fields. While the work in the Upper Po Valley has been carried out entirely by AGIP, simultaneously dozens of small operators, working within the limited blocks allowed under present laws, have drilled hundreds of shallow gas wells in the Po Delta district 150 miles to the east.

A 10-in. line has now been completed from these shallow fields, to Venice. The well depths range from 300 to 1,200 ft. in depth. Two overlap producing horizons yield small per-well production, often no more than 25,000 to 250,000 cu. ft. daily and at subatmospheric pressures requiring a vacuum to pull the gas into the 4-in. lines to the neighboring towns.

The extensive gas reserves developed largely since the end of the war by AGIP in the Upper Po Valley have been in comparatively deeper horizons. Fields include Caviage, Podenzano, Ripalta, and San Giorgio, as well as Cortemaggiore. The newer gas-producing areas are in the uppermost Miocene or Mio-Pliocene and are the result of geophysical investigations, principally seismic, during the last 10 or 12 years. Their location is out on the flat Po Valley plain.

Caviaga field, located about 25 miles southeast of Milan, has 15 completions. Three dry holes into edge water seem to limit the field on the north, south, and west, but 15 Caviaga, the easternmost well, is the highest structurally and may extend the field in that direction. A stepout is planned about a mile east of present production, and the field has been developed on a conservative basis with 1,650 ft. between wells on a triangular pattern.

To Step Up Output

Present productive area at Caviaga is less than 2,500 acres; pay zone is about 650 ft. thick with a net thickness of about 200 ft. considering the shale partings. The field has been marketing about 8,000,000 cu. ft. daily through 4-in. lines to Milan and to steel mills in Bergamo. Plans call for stepping up this production considerably with completion of a 10-in. outlet now under construction.

No. 14 Caviaga recently attracted considerable attention when it blew out with an estimated 30,000,000 cu. ft. of dry gas while preparing to run production string to the top of the Messinianan at 4,800 ft. The well continued wild for several weeks, wasting fuel estimated at the equivalent of a boatload of coal daily. It was capped successfully using eight winches with manpower to draw the hood down over the casing head. The rubber gaskets in the control head evidently had been cut by sand.

A few days after the No. 14 blowout, the production string in 11 Caviaga, located 1,650 ft. to the northwest, parted in the Calabriano zone, the loose unconsolidated sands of Quaternary Age found from 1,650-3,600 ft. throughout the field. No. 11 was successfully plugged but not before No. 13 had cratered with the loss of the derrick. None of the Caviaga wells had previously caused any trouble, and the pressure at which

No. 14 blew out was at the somewhat abnormal level of 2,200 psi.

Podenzano field, 6 miles south of Piacenza, was the first commercial discovery of gas in the general area. It was discovered in 1931 and is now approaching exhaustion. The gas production went chiefly to Piacenza. There were about 30 completions in the Messinianan from 2,600 to 4,000 ft., and a small amount of crude, now about 8 bbl. daily, also has been produced. The structure was discovered in the early geophysical work with gravity equipment and some electrical resistance measurements. The east-west anticlinal axis is faulted on the north.

A mile to the east to Podenzano, on the same trend but slightly offset to the north, is San Giorgio. This small domal structure has 14 wells making gas and oil from the same approximate horizon at the same depth. It is considered to be of only minor importance.

The Ripalta area is located 6 miles northeast of Caviaga field. One good gas well has been completed, and production string run recently to bring in the No. 2 well. Further development of the area is planned by AGIP. The completion was at 5,100 ft. from the Upper Miocene, and the pay zone was slightly lower stratigraphically than at Caviaga where somewhat larger wells have been obtained.

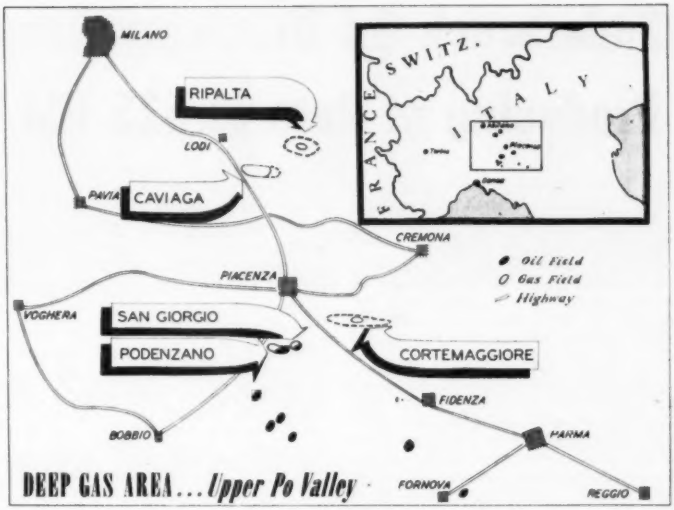
Found in 1948

Of top interest, from the standpoint of either oil or gas, is the Cortemaggiore structure, a 1948 discovery located 12 miles southeast of Piacenza. It offers the possibility of considerably larger gas reserves than Caviaga in addition to the prospective oil production.

The 1 Cortemaggiore was completed as a major gas discovery at 4,600 ft. in the same horizon as at Caviaga. No. 2, ¾ mile east of No. 1, also found the same gas horizon but on a drill-stem test showed at the rate of nearly 3,000 gal. of a dark amber fluid together with 4,500,000 cu. ft. of gas. The well was carried to a total depth of 6,200 ft.

Recent reports from Italy say the two Cortemaggiore wells have a total daily production of about 80 tons of crude. This, with the gravity reported of 0.8485 (35.4° A.P.I.) is the equivalent of about 595 bbl. daily. AGIP geologists consider that the structure has a possible producing area of 50 sq. km. (about 12,500 acres) and place the thickness of the formation at 140 m. (460 ft.). Gasoline content of the crude is reported at between 37 and 40 per cent. The Cortemaggiore structure is about 12 by 4 km.

No. 3 Cortemaggiore has been started about ¾ mile south of No. 2, and further development as rapidly as possible is planned. The structure is along narrow east-west fold with possibly several domes along the axis.



Map of the upper Po Valley showing oil and gas fields

Seismograph work shows that the axes of the several gas-producing structures in the vicinity of Piacenza have an east-west, or ESE-WNW, alignment. They are not steeply folded, especially at the plunging east and west ends, and there is a good chance that additional folding directly related to these structures is still to be found.

Of considerable interest as a geological phenomenon are the fissures which appeared following the blowout in 14 Caviaga and the trouble with the other two wells. It has been suggested that the high-pressure gas from the deeper Messinianan charging the upper zone was sufficient to dome these unconsolidated sediments.

These fissures or faults range up to 2 in. in with a vertical displacement along any one of about 4 in. They occurred between No. 11 and No. 14, running regularly across the axis of the anticline and in some cases cracking concrete slabs as well as the walls of brick buildings. The eastern and western ones are downthrown toward the center, indicating a small graben over the width of the affected area.

1931 Was Peak Year

Small quantities of oil have been produced in Italy since well into the last century. Peak production was reached in 1931 with an output of about 570 bbl. daily. This has since dwindled to around 200 bbl. daily, the estimated present production. The relatively minute output emphasizes the importance to Italy of any oil discoveries which on further development may prove to be substantial.

These minor oil producing areas

International

are located in the Apennine foothills of Emilia not far south of the region where the more extensive gas reserves have been developed. The Emilia oil production is from comparatively shallow depths of 500 to 2,000 ft. in the Argille Scagliose, a peculiar "heavy shale" of probably Cretaceous or Eocene Age. These early discoveries of a very high-grade "filtered" oil were made mostly by accident with some guidance from seepages.

Overlying all the present activity in oil and gas exploration in Italy is the issue of liberalizing the Mining Law. The question has been under study for more than 2 years, and no final decision is expected until fall. AGIP contends that a single state agency should be in charge, but at the same time the government hopes for Economic Cooperation Administration assistance in obtaining equipment for all branches of the petroleum industry.

AGIP is making the most of its recent oil and gas discoveries to strengthen its case, and it is problematical whether the advocates of broader participation in the exploration and production effort will be able to gain adoption of the necessary amendments.

Principal foreign company interested in Italy is the Standard Oil Co. (N.J.) organization. In addition, there is MacMillan Petroleum Co. which plans to explore in Sicily, numerous small Italian operators, and several large Italian industrial concerns.

Suderbruch Oil Discovery Now Producing at Rate of 525 Bbl.

THE Suderbruch discovery of Gerwerkschaft Brigitta in the Hanover area of Central Germany on further testing has produced at the unusually high rate of 525 bbl. daily.

This was obtained through a $\frac{7}{8}$-in. choke which was subsequently reduced to $\frac{1}{8}$-in. Pressures, however, were: casing, 590 psi., and tubing, 455 psi.; gas-oil ratio was 85:1.

The well, 1 Suderbruch, found oil at about 6,400 ft. *(The Oil and Gas Journal, August 25, page 90).* The interdomal structure is producing from the Cornbrasch. The 34.5°-gravity crude is much lighter than other Hanoverian crude. Suderbruch is at present the deepest producing well in northwestern Germany.

North of the Hanover area and between Bremen and the Dutch border, a gas deposit has been found south of Oldenburg near Quakenbrueck in structural drilling by Deutsche Vacuum Oel, A.G. The gas appeared to be in a small pocket, but further drilling will determine if it is commercial. This is a joint Deutsche Vacuum-Brigitta concession. The gas was found at 220 m. (720 ft.) in counterflush well 13, and gas shows were tested in 13A, 16, and 17.

Higher Output Sought

Other developments in German exploration and production point up the effort being made to develop more substantial production and the possible importance of the Emsland region in western Germany.

Ruehlertwist 2, which ranks with Suderbruch as the significant German discovery since the war, has not yet begun producing, but the No. 3 well is rigging up, and equipment is being moved in for No. 4. The operator is the German company, Wintershall, A.G.

In Georgsdorf field, well 94 has found edgewater on the southern flank and apparently defines the field in this direction. Well 102 earlier determined what appears to be the limit on the north. Only relatively short stepouts are being made by the German operators in drilling the field. There recently were nine wells drilling in Georgsdorf.

Northeast of Georgsdorf between the fields of Lingen and Adorf, the small amount of oil found by the wildcat, 1 Dalum-West, in the Valendis appears to be noncommercial, but the hole is to be deepened.

According to a report in mid-August, new production also has been found in western Germany near Osnabrueck at a depth of about 2,000 m. (6,600 ft.). Production was reported initially to be 40 cu. m. daily (about 250 bbl.), but further details on the operation were not available.

Reflection seismic work is being carried out by a German company in the tideland offshore area near Duhnen-Neuwerk-Schaarhoern in the North Sea. One of the 15 geophysical crews now working in Germany is engaged in this project investigating the west flank of the Heide-Meldorf structure.

International

Techint to Lay 50-Mile Tierra del Fuego Line

Techint Pipe Lines, a division of Cia. Tecnica Internacional, S.A., has contracted with Corp. de Fomento of Chile to construct an 80-km. (50-mile) crude-oil pipe line in the Tierra del Fuego area of southern Chile.

The 8-in. line will carry oil from the producing area at Cerro Manantiales to a terminal on the Straits of Magellan at Caleta Clarencia. An underwater loading line about 1 mile long also will be laid.

Most of the equipment for the project is being supplied by the Chilean Government organization, and work is scheduled to get under way in the near future.

EXTRACTOR TOWER TO WORK IN FRANCE

This 60-ton, 53 by 8-ft. extractor tower is destined for the Gravenchon refinery of Socony-Vacuum Francaise in Normandy. It is shown here as it was loaded in New York aboard the S. S. Molda, which sailed August 12 for Le Havre. The tower is used to extract asphalt in the manufacture of lubricating oils. It is a part of the expansion of the Gravenchon plant which prewar had a capacity of about 5,000 bbl. daily. The refinery was badly damaged during the war and its equipment scattered over central Europe by the Germans. Present capacity is in excess of 15,000 bbl. daily in skimming operations

J. B. HAMBLEN | H. S. READ | R. T. COLQUETTE | T. E. BEAIRD | A. L. REID

Pan-Am Southern Corp. Begins Integrated-Company Operation

PAN-AM SOUTHERN CORP. effective August 31 became a completely integrated concern engaged in exploration, production, refining, pipeline transportation, and marketing with headquarters in New Orleans. The new organization was made possible through a recently approved merger of Pan American Petroleum Corp. and Root Petroleum Co. which combined had 75 years experience in petroleum operations.

The new company is headed as president by Bruce K. Brown, who recently resigned as vice president and director of Standard Oil Co. (Ind.), the parent company. Prior to the merger he was president of Pan American Petroleum Corp. In this article the Journal explains the scope of the new company's operations and the key personnel which includes men who are widely known in the petroleum industry.

The Pan-Am Southern officers and board of directors, of which Brown is chairman, include R. L. Aycock, director and general manager of bulk sales; Horace Canon, director and vice president; Roy J. Diwoky, director and executive assistant to the president; J. B. Hamblen, director and general manager of manufacturing; D. P. Hamilton, director; T. W. Hughes, director and vice president; F. R. Lutenbacher, director and general manager of sales; H. S. Read, director and vice president in charge of distribution and marketing; A. L. Reid, treasurer; A. J. Ganier, comptroller; T. E. Beaird, secretary; and Paul Schaeffer, purchasing agent.

Crude-oil exploration, production, purchasing and transportation activities are directed by Milton C. Hoffman, general manager of exploration and production, at the Shreveport, La., office, formerly headquarters for the Root company.

© Bachrach

BRUCE K. BROWN

The corporation owns oil leases in several states and owns some fee land in South Arkansas. In 1948 the company-owned production amounted to roughly 800 bbl. a day.

Within the last year the company has established itself as an active purchaser of new crudes.

More than 7,800,000 bbl. of petroleum were moved in 1948 over the company's system of more than 200 miles of direct pipe lines and gathering lines.

Serving the pipe line are six company-owned pumping stations with a total capacity of 50,000 bbl. a day. A two-way radio communication system, including seven stations and seven mobile units in company vehicles, is used to dispatch movements and expedite operations.

J. D. Aimer is chief geologist; G. P. Brown, manager of the land department; S. H. Casey, manager of the crude-oil purchasing department, and G. G. Moore, manager of production and pipe lines.

The company owns two refineries which manufacture a complete line of petroleum products including the compounding of lubricants. The one at El Dorado, Ark., is serviced by pipe line. It has a crude-oil charging capacity of more than 25,000 bbl. a day. In addition, the cracking facilities can charge daily 6,500 bbl. of fresh gas oil. Storage tanks with a capacity of more than 1,500,000 bbl. form part of the property. R. T. Colquette is general manager of the El Dorado refinery; J. W. Bertetti, chief engineer; E. N. Kimes, general superintendent; John Brown, assistant superintendent; Frank Jenkins, mechanical superintendent, and J. L. Ward, industrial relations supervisor.

The second refinery, at Destrehan, La., includes 1,050 acres with a mile of Mississippi River frontage 18 miles from New Orleans. Built to produce asphalt from Mexican crudes, the refinery processes about 8,000 bbl. of domestic crudes daily. The refinery includes a lube-oil blending plant and a grease plant. Terminal facilities for loading and unloading barges and deep-water vessels incorporate 2,700,000 bbl. of tankage.

J. D. Tufts is superintendent of the Destrehan refinery; V. G. Relimpio, assistant superintendent; R. L. Argus, assistant superintendent, and T. G. Hanlon, personnel and safety supervisor.

Pan-Am Southern has terminals in Tennessee, on the Mississippi River at Memphis and on the Cumberland River at Nashville from which products are moved by tank car and tank truck. Additional tankage is under consideration at both terminals, which also handle some custom terminaling for other companies.

A pipe-line terminal with a capacity of about 170,000 bbl. is under construction at Birmingham, Ala. It will draw products from the adjacent Plantation Pipe Line. J. E. Monroe is general traffic manager, assisted by L. F. Andry at New Orleans and W. K. Gibbs at El Dorado.

Pan-Am Southern owns six petroleum-product barges and 267 tank

cars, for which there is a modern repair shop. Barges, tank cars, pipe lines, company transport trucks, contract haulers, and common carriers are used to service primary supply points in Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, and Tennessee.

The company markets through a total of about 200 bulk plants in Alabama, Arkansas, Louisiana, Mississippi, and Tennessee.

Dwight F. Benton, former Root president, is being advanced to another position with Standard of Indiana, parent company of Pan Am Southern.

Time Turned Backward as Industry Celebrates Birthday in Pennsylvania

by Joe Szafran

TITUSVILLE, Pa. — The pages of time turned back almost a century while the nation's oil industry celebrated its 90th birthday here August 27.

Oilmen from far and near came to look into the past and look into the future. A top member of the Truman administration addressed the gathering and sized up the present world situation.

The celebration was held at the spot where on August 27, 1859, Col. E. L. Drake brought in the nation's first oil well and unknowingly started a multibillion-dollar industry.

Secretary of the Navy Francis P. Matthews, who knows the importance oil has been to the Navy in two world wars, told the crowd of several thousand that western civilization faces its greatest challenge from Godless, cynical, grasping, materialistic, Marxist Communism.

"The outcome of the new conflict of ideologies depends on us," Matthews declared. "We can favorably resolve even that issue if we so desire and are ready to pay the price for so precious a victory."

"We must neither hesitate nor falter in our search for peace, no matter how long the road or rough the way," the Navy secretary declared. "We have learned through the operations of the Truman doctrine, the Marshall Plan, and the Atlantic Pact that we can hold off aggression if we demonstrate firmness of purpose and adequate military strength to back up our foreign policy."

The crowd got a glimpse of the military strength as 75 naval planes roared overhead. Also overhead was the Navy's Truculent Turtle, the bomber which holds the world's record for long-distance flying.

Sen. Andrew F. Schoeppel of Kansas told a luncheon meeting that America's standard of living "is in a large degree built upon the availability of petroleum and its products." He added, "Unhampered by restrictive legislation, oil men have shown over and over again that they can keep this nation well supplied with all the products of petroleum that it needs."

One of the proudest people at the ceremony, which was held at Drake Well Museum, was Mrs. Ross E. Carver of Nashua, N. H., a granddaughter of Col. Drake. She pressed a button to start simulated reactivation of the well which struck it rich 90 years ago. Some of the best available petroleum was deposited in the casing of the 69½-ft. well, and a hidden pump brought it to the surface.

Wynne Buys Control of American Liberty Oil Co.

DALLAS. — Toddie L. Wynne last week purchased the full half interst of C. W. Murchison in American Liberty Oil Co. and its subsidiaries.

Wynne acquired Murchison's interest for a consideration of $8,000,000 in stock and cash. The deal dissolved a partnership dating back to 1931.

Wynne, who has been chairman of the board, now is president of American Liberty, a position formerly held by Murchison. D. R. Zachry will continue as executive vice president and general manager.

Wholly owned subsidiaries are: American Liberty Drilling Co., American Liberty Marketing Co., and Talco Pipeline Co. Companies in which a substantial interest is owned are Southland Oils, Inc., which operates two refineries in Mississippi; Paluxy Asphalt Co., and Texas Canadian Oil Co.

American Liberty operates a refinery at Talco in northwest Texas, and a cycling plant in Blessing field, Matagorda County.

American Liberty's producing and other properties are scattered over Texas, Louisiana, Mississippi, New Mexico, Utah, and Wyoming.

Higher Oil Output May Reduce Tax Requests

AUSTIN.—Gov. Allan Shivers told newsmen this week that the legislature which will meet in January may not have to raise as much new tax revenue as some have anticipated and based part of this optimism on the increase in September oil allowables.

The governor said that the business outlook is brighter, tax collections are higher than predicted, and that oil production is on the increase. "If there's not a further decrease in oil production, we may need a lot less money than we thought," Shivers told the press.

Louisiana Grants Four Charters to Oil Firms

BATON ROUGE. — Four charters were granted to oil concerns last week by the Louisiana secretary of state, Wade O. Martin, Jr.

These included Delta Gulf Drilling Co., incorporated in Wilmington, Del.; Dee Dee Corp., petroleum products company of Shreveport which was incorporated for $100,000; Jalco Oil & Transportation Co., Inc., New Orleans, which was incorporated for $10,000; and Lakeside Oil Co., Inc., a Shreveport firm engaged in general oil and gas business.

Next Week

Record breaking well drilled by Roland Drilling Co.—Twenty-five miles south of New Orleans, Tide Water Associated Oil Co. 1 State Lease 1299 has been completed at 13,000 ft., with bottom-hole pressure of 12,635 psi. Article by the Journal's Gulf Coast editor.

Pressure maintenance at Magnolia field, Arkansas.—This field represents the state's most important petroleum reserve, and District Editor D. H. Stormont describes how Carter Oil Co. and other operators are efficiently controlling reservoir pressure by flank injection of water.

Flexibility and efficiency feature filter plant.—Equipment and operating data for this installation at a Bayonne, N. J., refinery are discussed by Refining Editor George Weber.

Compressibility factors of natural gas.—Professor Paul Buthod, refining engineering department, University of Tulsa, presents six charts for natural gases of different specific gravities, with typical calculations illustrating practical uses of the charts.

Field tests of corrosion inhibitors.—For improving water-flooding operations, three experts in the Bradford, Pennsylvania, field give test data and valuable lease operating information.

PERSONALS

Spencer Has Had 27-Year Career in Oil Industry

P. C. SPENCER, who became chief executive of Sinclair Oil Corp. early this year, has had a 27-year career in the oil industry, a large part of which has been spent in the legal end of the business.

Spencer became president of Sinclair Oil, the parent Sinclair company, when H. F. Sinclair, founder and head of the companies for 33 years, relinquished active direction of operations and became chairman of the board.

The present head of the Sinclair organization was born in New York state in 1893, graduated from the University of Nebraska in 1916, and served in the U. S. Army in World War I. For 2 years after the war, he was secretary to Sen. Francis E. Warren of Wyoming.

Spencer entered the oil business in 1922 when he joined Producers & Refiners Corp. in a legal capacity. He was general counsel of the company and its subsidiaries from 1927 to 1934. He also held executive positions in several affiliated natural-gas companies, including the presidency of Southwestern Development Co. and Canadian River Gas Co. and vice presidency of Colorado Interstate Gas Co. From 1922 to 1928 he was chairman of the Republican State Central Committee in Wyoming.

Spencer became active in the Sinclair organization when it acquired the Prairie companies, of which Producers & Refiners Corp. was a subsidiary. He moved to New York in 1934, working in Sinclair's legal department. In 1946 he became general counsel of Sinclair Oil. He was a leading opponent of ratification of the Anglo-American oil agreement shortly after the war, and his brief on the subject was given wide attention.

In 1947, Spencer became president of Sinclair Refining Co., a position he continues to hold. In the fall of the following year, he was made executive vice president of Sinclair Oil Corp., continuing until his election as president last January.

R. L. Davis has been named manager of the gas-gasoline department of Shell Oil Co., Inc., in the New Orleans exploration and production area. Formerly manager of the gas department in the company's Houston refinery, he is succeeded by **L. J. Snyder.** Assigned to succeed Snyder as manager of the alkylation department of the Wilmington, Calif., refinery is **W. M. Frech,** who was promoted from manager of the gas department at the company's Norco, La., refinery. **S. F. Good,** formerly assistant manager, succeeded Frech as manager.

D. T. Andrus and **A. J. Saxe,** of Bradford, and **R. B. Bossler,** of Oil City, all Pennsylvania oil producers, have been named to represent the area on the advisory board of the Petroleum Production Research Foundation at Pennsylvania State College

W. A. McMillan has been named assistant director of research at The Texas Co.'s research center, Beacon, N. Y.

George W. Nigh, assistant mechanical superintendent at the Bayonne, N. J., refinery of Tide Water Associated Oil Co., has been elected chairman of the metropolitan section, American Society of Mechanical Engineers.

C. P. Porter, production superintendent for Coast Oil Corp., has been transferred from Alice, Tex., to Dallas. He is also vice president and general manager of the company, and production superintendent for Tex Moss Petroleum Co. and Petroleum Reserve Corp.

Parke A. Dickey, geologist in the Tulsa research laboratory of Carter Oil Co., recently spent several weeks in the Lander, Wyo., area, and has now returned to Tulsa.

S. L. Friederichs, formerly natural-gasoline process engineer for Phillips Petroleum Co. at Oklahoma City, has been transferred to Phillips, Tex., as a treating engineer.

Glenn Nelle has joined General Petroleum Corp. as assistant manager of Rocky Mountain operations, headquartered in Casper, Wyo. He formerly served as assistant manager in Eastern Venezuela for Socony-Vacuum Oil Co., Inc. The post now filled by Nelle with General Petroleum has been vacant for the past 9 months.

Loyd Somors, drilling foreman in the Marlow, Okla., area for The Texas Co., has been transferred to the Seminole, Okla., area as field foreman.

Lt. Comdr. Louis J. Kuliot, U. S. Naval Reserve, has been named inspector of naval petroleum reserves in California at Los Angeles. **Lt. F. M. Tully** has replaced **Comdr. F. L. Ruhlman** as assistant inspector of naval petroleum reserves in California, with headquarters at Elk Hills. **Max C. Eastman,** petroleum engineer for the inspector of naval petroleum reserves in that state, has been appointed as the Navy's member on the operating and engineering committee for the Elk Hills unit plan. The post formerly was held by the late Capt. V. H. Wilhelm.

J. D. Moore, former associate petroleum engineer for the Galveston Bay district, Humble Oil & Refining Co., has been transferred as petroleum engineer to the Avoca, Tex., district.

Harold M. Smith, head of chemistry and refinery work at the U. S. Bureau of Mines petroleum-experiment station at Bartlesville, Okla., recently received the highest award that Department of the Interior can bestow upon an employe for distinguished service. Smith received the gold medal and citation in Washington, D. C., August 30 in recognition of his 26 years of service with the Government, and his outstanding contributions to science, research programs, and research. He is also assistant supervising engineer at the petroleum-experiment station in Bartlesville and has been on its staff since 1923. He received his A.B. and A.M. degrees in chemistry from Clark College, Worcester, Mass., in 1921 and 1922, respectively.

Thornton Tonvin, tool pusher for Loffland Brothers Co. at Houma, La.,

PERSONALS

has been moved in the same capacity to the Bay City, Tex., area.

D. A. Shock has been named senior research chemist in charge of the production-chemistry group at Continental Oil Co.'s laboratory in Ponca City, Okla. He formerly was on the research staff of the University of Texas, Austin, where he had been in charge of corrosion-research problems, including those sponsored by the Natural Gasoline Association of America. Prior to his work at the university he was employed by International Minerals & Chemicals Corp., Austin, and Dow Chemical Co., Midland, Mich. He is a graduate in chemical engineering from Colorado College, Colorado Springs, and obtained his master's degree in chemistry from the University of Texas.

Otto Wendenburg, geophysicist for Gulf Research & Development Co. at Laurel, Miss., has been transferred to Alexandria, La., where he will be engaged in interpretation of seismic data.

John A. McCutchin, Bay Petroleum Corp., has been placed in charge of the company's new production office in Calgary, Alta., Canada. Formerly with Shell Oil Co., Inc., in Tulsa, and Sohio Petroleum Co. at Mount Vernon, Ill., McClutchin will be in charge of both the land office and geological division in Calgary for Bay Petroleum.

Harry A. Brown, superintendent of Frontier Refining Co.'s Cheyenne, Wyo., refinery, has been named vice president in charge of manufacturing for the company. He joined the firm 3 years ago and assumed his duties as refinery superintendent in May 1946. He formerly was with Universal Oil Products Co. in Chicago.

Dr. Bruce H. Stage, professor of chemical engineering at California Institute of Technology, has been named winner of the first $1,000 Precision Scientific Co. award in petroleum chemistry, and will receive the award at the September 19 annual meeting of American Chemical Society in Atlantic City.

Max Bailey, driller for Basin Drilling Co. in the Pearsall, Tex., area, has moved to the Graham, Tex., area in the same capacity.

Glenn Purcell, formerly senior technologist in Shell Oil Co., Inc.'s head office manufacturing department, New York, has been transferred to Shell Chemical Corp.'s Houston plant and promoted to assistant superintendent.

Victor Reid Rose has been named a director and vice president of International Petroleum Co., Ltd., affiliate of Standard Oil Co. (N. J.). He formerly was manager in charge of the Colombian branches of the National City Bank of New York.

Bishop Craddock, Sundown, Tex., has been named Mid-Continent division field superintendent for Honolulu Oil Corp. Formerly superintendent of the Slaughter field for the firm, Craddock joined the company 12 years ago, and prior to that was with Ohio Oil Co., and Humble Oil & Refining Co.

J. Roy Derrick, field superintendent for Wise & Hawkins and Velma Petroleum Corp., has been named assistant to **Phil Yeckel,** general manager of King, Warren & Dye, Midland, Tex., independent oil operators. He will also serve as production superintendent for the partnership.

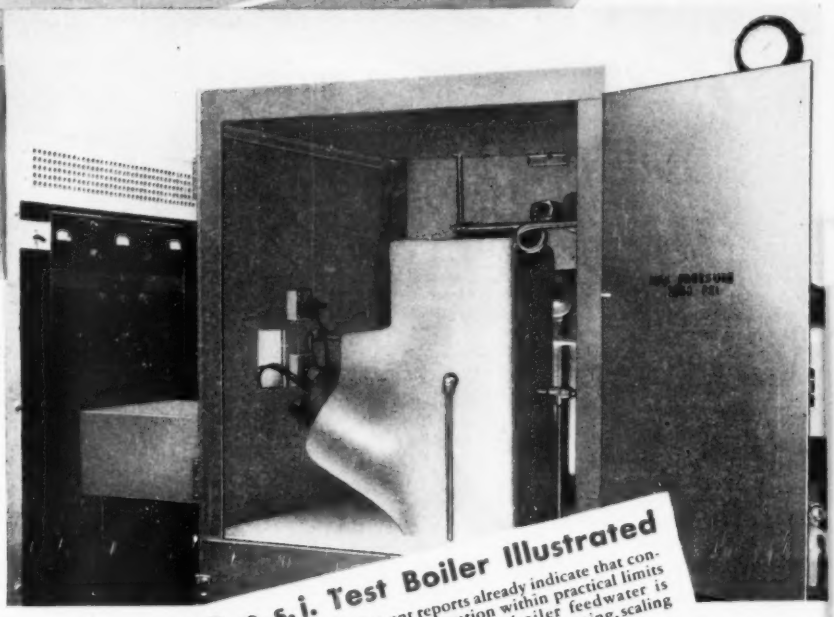
David Dorn, formerly of San Antonio, has been placed in charge of Forest Oil Corp.'s district land and geological offices at Wichita Falls, Tex., and **A. E. McCarver,** formerly stationed at Jackson, Miss., for the company, will serve as district geologist. **Robert I. Dickey,** Midland, Tex., regional exploration manager for the company, is supervisor.

D. D. Jackson, district operating superintendent, Harvey district, California Co., has been named district operating superintendent of the new offshore district, Gulf Coast division, production department. Other recent changes in the company include: **C. C. Alexander,** from petroleum engineer to district operating superintendent, Harvey district, Gulf Coast production; **W. L. Effinger,** from acting division exploration superintendent to division exploration superintendent, Lexington; **N. A. Hays,** from production, western division, Denver, to geology staff, New Orleans; **J. J. Kent,** from head clerk, offshore operations, to administrative assistant to division operating superintendent, Gulf Coast division; **J. H. Kinser,** from geologist to district geologist, Colorado, Utah, and Arizona district, Denver; **H. L. Patton,** from development geology staff, New Orleans, to production, Denver; and **J. H. Todd,** from acting geophysics superintendent to geophysics superintendent, New Orleans.

William G. Abbott, petroleum engineer for Amerada Petroleum Corp., at Longview, Tex., has been transferred to Big Lake, Tex., as district engineer.

Among guests who attended the August meeting of Houston Chapter of Nomads were, front row, left to right: H. L. J. Hunter, Australasian Petroleum Co., Papua, New Guinea; Marion Lowson, Anglo-Iranian Oil Co., Ltd., Iran; Roy L. Greenham, Australasian Petroleum Co., Papua, New Guinea; H. A. Sanchez, American Independent Oil Co., Houston; Ray Kail, Equipos y Servicios Especiales, S.A., Mexico City. Back row, left to right: Jimmie Doublas, Equipos y Servicios Especiales, S.A., Mexico City; E. W. Berlin, Standard Vacuum Oil Co., New York City; and A. E. Pedder, Anglo-Iranian Oil Co., Iran

Preparing for Your FUTURE



Data on 3,000 p.s.i. Test Boiler Illustrated

- Maximum operating pressure 3,000 p.s.i.
- Electronically heated by 15 KW, 540 KC induction coil, adjustable to produce varying heat transfer rates.
- Estimated maximum heat transfer rate per square foot of heating surface: 250,000 B.t.u. per hour. (Heat transfer rates in [illegible] 200,000 B.t.u. per square foot per hour [illegible] at 3,000 p.s.i.)
- Present reports already indicate that continuous operation within practical limits is possible when boiler feedwater is Nalco treated to prevent foaming, scaling and corrosion.
- Automatic controls, essentially the same as those on modern steam generators.
- Feedwater pre-heated and deaerated; steam condensed and returned to hot well.

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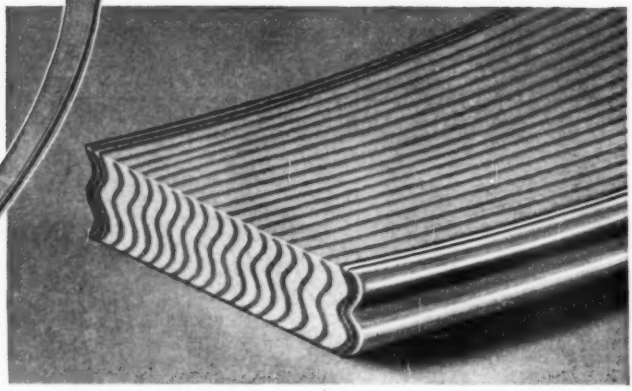

The Guardian Gasket is constructed of alternate layers of specially shaped strip metal and asbestos. It is made in a wide range of sizes for pipe flanges, boilers and other equipment. For *raised* face pipe flanges, Guardian gaskets with metal centering rings are recommended.

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GARLOCK Guardian gaskets are your most effective and economical protection against blow-outs and leaks under severe service conditions. They are unaffected by extreme temperatures and pressures.

Permanently tight joints are assured because the gasket compresses and rebounds instantly and repeatedly to conform with expansion and contraction caused by vibration or changes in temperature.

For protection against costly work stoppages in *your* plant, specify GARLOCK Guardian Gaskets.

THE GARLOCK PACKING COMPANY, PALMYRA, N. Y.
Tulsa, Okla. Houston, Texas Los Angeles, Calif.

GARLOCK

Two recently elected vice presidents of Trans-Arabian Pipe Line Co. are shown with President B. E. Hull in New York. C. A. Swigart, left, has returned to headquarters at San Francisco, where he formerly served as manager of Standard Oil Co. of California's pipe-line operations in California, and A. N. Horne, left, has departed for Beirut, Lebanon, where he will serve as resident executive officer and general manager of Tapline's construction project in the Middle East

Henry Bollig, formerly district superintendent for Ryan Consolidated Petroleum Corp. at Okmulgee, Okla., has joined Gold-Rubin Oil Properties as production superintendent at Borger, Tex.

W. K. Hastings, assistant seismic party chief, Gulf Research & Development Co. at Gillette, Wyo., has been transferred to the company's laboratories in Pittsburgh.

W. Dunham Smith has joined British American Oil Producing Co. as drilling foreman in Louisiana, headquartered at Lafayette.

W. E. Huston, president of Republic Oil Co., Pittsburgh, visited in Galveston recently for conferences with other company executives at the Texas City plant.

Harlan H. Yoakam, division geologist, Plymouth Oil Co., Sinton, Tex., has resigned and will remain in Sinton as a consultant.

E. W. Fort, formerly exploitation engineer for Shell Oil Co., Inc., at New Orleans, has joined the firm of Meyer & Achtschin, consultants, in Dallas.

P. W. Wolf, tool pusher for Delta Drilling Co. in the Newcastle, Wyo., area, has been transferred to Kyle field at Medicine Bow, Wyo., in the same capacity.

F. G. Culbertson, assistant district petroleum engineer for Humble Oil & Refining Co., has been transferred from Tomball, Tex., to the company's general office in Houston as associate petroleum engineer. **Delma Baucum,** assistant district superintendent at Freer, Tex., has been transferred to Colorado City, Tex., as district superintendent.

C. H. Austin, foreman for Montex Drilling Co., Levelland, Tex., has been transferred to the Fort Worth area in the same capacity, and **W. F. Tipton,** tool pusher at Levelland, has been transferred in the same capacity to Brownfield, Tex.

SHIFTS—

W. A. Sinsheimer, Jr., engineer, DeGolyer & MacNaughton, Tulsa to Dallas; **Ralph H. Wilson,** superintendent, Shell Oil Co., Inc., Healdton, Okla., to Tulsa; **R. H. Whitney,** geologist, Geological Service, Inc., Memphis, Tenn., to Dallas; **J. B. Vaughan,** geologist, Ashland Oil & Refining Co., Evanston, Ind., to Henderson, Ky.; **Henry Snyder,** Danciger Oil & Refining Co., New Iberia to Harvey, La.; **H. B. Smyrl,** Petty Geophysical Engineering Co., Kermit to San Antonio, Tex.; **L. E. Ringer,** geologist, Advanced Exploration Co., Inc., Cleburne, Tex., to Houston; **Louis L. Watson, Jr.,** geologist, Sinclair Oil & Gas Co., Tombstone, Ariz., to Denver; **Elmer F. Page,** engineer, Phillips Petroleum Co., Oklahoma City to Kansas City, Kans.; **B. J. Seagraves,** superintendent, Warren Oil Corp., Winnsboro, La., to Houston; **G. J. W. Murphy,** engineer, The Texas Co., Freer, Tex., to Houston.

J. D. Norris, superintendent, Penrod Drilling Co., Edna to Colorado City, Tex.; **John H. Adams,** engineer, Carter Oil Co., Pauls Valley, Okla., to Grand Rapids, Mich.; **H. F. Kincaid,** Ohio Oil Co., Cody, Wyo., to Sidney, Neb.; **R. E. Beithman,** geologist, Ohio Oil Co., Casper, Wyo., to Sidney, Neb.

J. D. Milliken, formerly petroleum engineer for The Texas Co. at Cody, Wyo., has joined Trigood Oil Co., Worland, Wyo., as field engineer.

DEATHS

Walter G. Scharmann, 45, senior engineering associate in the development division, Standard Oil Development Co., died August 24 in Westfield, N. J. He had been with the company 20 years, and was identified with development of the hydrogenation process, synthetic fuels, and the process which resulted in the large-scale production of synthetic toluene.

Hugh M. Stalcup, 65, retired vice president of Skelly Oil Co., died August 24 at Bentonville, Ark. He entered the oil business in 1919, and joined Skelly in 1923 as executive assistant. He was made vice president of production in 1925. He was a leader in the fight for conservation of natural resources in the Texas Panhandle area.

F. A. Mathis, 50, Tulsa, controller for Stanolind Pipe Line Co., died August 23. He joined Sinclair-Cudahy Pipe Line Co., Stanolind predecessor, in 1919 and was appointed auditor and controller for Stanolind in 1948.

William H. Shields, 64, Tulsa, division manager for Texas Empire Pipe Line Co., died August 27. He joined the company in 1908, and in 1929 was named division manager.

Willard Edmor Bullock, 58, assistant superintendent of Tide Water Associated Oil Co.'s Wilmington, Calif., refinery, died August 21.

Howard Murchie, 62, retired superintendent of Doyle Petroleum Co., before it was purchased by General Petroleum Corp., died in Bakersfield, Calif., August 22.

Charles Wright Sulzer, 68, veteran service engineer for Baroid Sales Division, died in Long Beach, Calif., August 22.

Clay Tallman, 75, until his retirement in 1939 general counsel for Stanolind Oil & Gas Co., and Stanolind Pipe Line Co., Tulsa, died recently in Montrose, Colo. He served as commissioner of U. S. Land Office under President Woodrow Wilson.

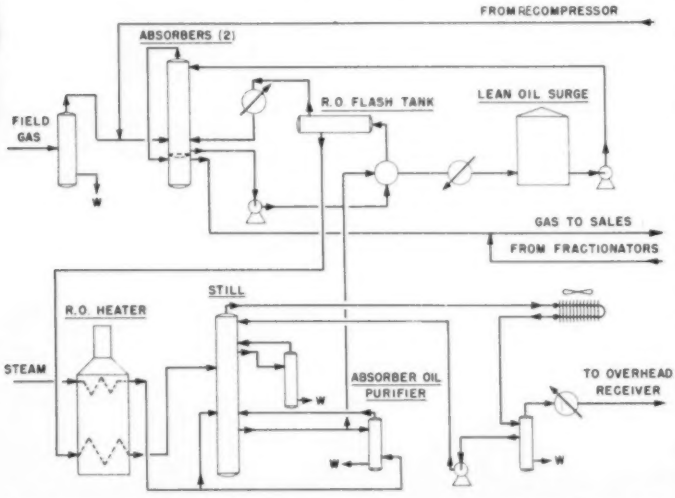
Stano ABSORPTION PLANT

by R. B. Tuttle
Associate Editor

Gets initial tests a year after construction started—Second major 1949 project completed

This new field processing unit, recently placed in operation by Stanolind Oil & Gas Co., is designed for a maximum raw gas input of 150,000,000 cu. ft. daily. When operating on an input of 100 million cubic feet per day of natural gas the plant produces 26,600 gal. of natural gasoline and 36,600 gal. of liquefied petroleum gas

INITIAL tests on Stanolind Oil & Gas Co.'s Stano absorption plant in Grant County, Kansas, were made just a little more than 1 year after its construction was started. One of several new natural-gas field processing plants included in its expansion program, this unit is the second major project to be completed for Stanolind in 1949. The company's Slaughter field plant in West Texas was the first new project, going on stream a few weeks earlier *(For article on Slaughter plant, see The Oil and Gas Journal issue of May 26, 1949, page 68)*. Capacity ratings, locations and various information on the complete list of new Stanolind gas-plant field projects was published in The Oil and Gas Journal, March 25, 1948, page 150.



Flow arrangement in absorption and distillation section of the Stano unit near Ulysses, Kans.

Natural gas is supplied to the new plant through 190 miles of gathering system which is currently connected to 243 Hugoton field wells. The pipeline system ranges in size from 4 to 30 in. and is installed for connecting 25 additional wells which are scheduled to be tied into the system as needed to maintain input volume to the absorption unit. Residue gas is delivered by the new Stano plant to pipe line for transmission to the Kansas City area. The gas pipe line is owned and operated by Cities Service Gas Co.

Design capacity rating on the new Stano installation is 100,000,000 cu. ft. of raw gas on daily standard basis. Liquid extraction includes natural gasoline and an L.P.G. material consisting principally of butane. Operations are regulated to maintain a heating value of 950 B.t.u. per standard cubic foot, water-saturation basis, on residue gas.

Additional flexibility over the conventional absorption operations has been designed into the process. This flexibility provides for the manufacture of L.P.G. having any vapor pressure up to 100 psi., as desired. Operational flexibility also permits processing a maximum of 150,000,000 cu. ft. per day of raw gas at only slight reduction in recovery efficiency.

This battery of aerial-type condensers is in service on still overhead make. On a design basis these units operate to remove approximately 22,000,000 B.t.u. hourly

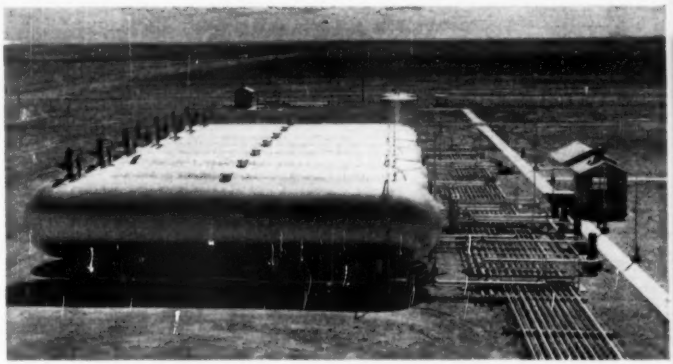
Raw gas is delivered to the plant at approximately 350 psig. pressure. Currently well-head pressure is ample for plant operations without compression. Plans for the plant's future operation include compression equipment for handling the raw gas when made necessary by declining reservoir pressure. Also included in plans for the future is 185 miles of gathering system extension for connecting additional wells in a 200,000-acre producing area at Hugoton. Ultimately, more than 300 wells may be connected to the extended system.

Processing Arrangement

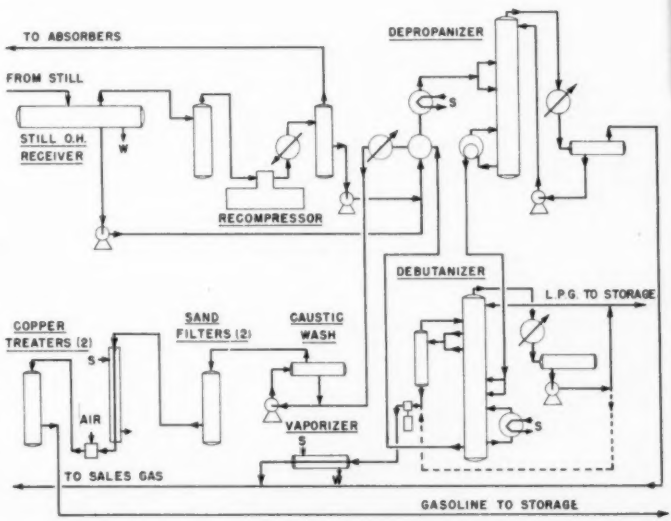
On leaving the plant's inlet scrubber the raw gas is run directly to the main absorbers, two 90-in. by 57-ft. vessels. On a design basis peak-load capacity of each of these absorbers is 75,000,000 standard cubic feet of raw gas daily. A portion of each absorber vessel serves as a scrubber for the residue gas. Bulkheads in the bottom section of the absorber vessels separate the residue-gas scrubbers from the absorption section. Twenty plates are installed to extract 88 per cent of the normal butane at summer operating temperatures when the design rate of 375 g.p.m. of lean oil is maintained for each scrubber. Residue gas from the main absorber plus overhead vapor from the depropanizer and butane side draw is run through a recording - indicating calorimeter, metered and then delivered to the gas company's transmission line at 260 psig. minimum.

Enriched oil from the absorbers, after passing counterflow to the lean-oil stream from the still in exchangers, is flashed and then is delivered to the still's fired heater. Flashing of the exchanger-heated rich oil takes place in the surge or feed drum for the still heater. Rich oil is moved by pump from the absorbers to the still via the exchanger, surge-flash tank, and heater. The flashed vapor is passed through conventional tubular exchanger-type coolers and is recycled in the absorbers.

In addition to operating to heat the

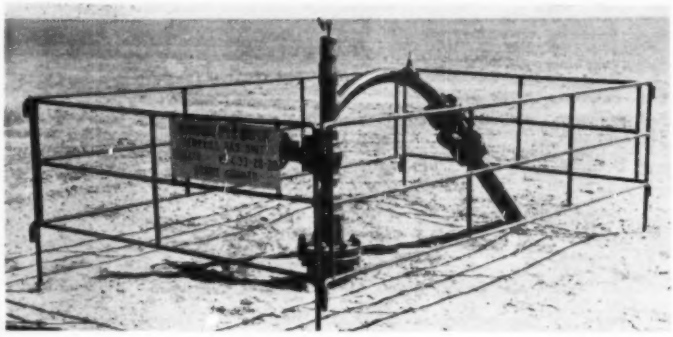


Plant production, natural gasoline and L.P.G., is stored in these seven horizontal vessels. Unloading pumps may be seen to the right of the tank-battery manifold



Process flow scheme in the fractionation and product treating section of Stanolind's new field processing unit

Left: The instrument panel in the Stano plant's control room. Right: These generators, gas-engine driven and rated at 500 kw. each, supply electricity for plant operations and for adjacent dwellings occupied by operating personnel



This gas-well hookup is typical of the 243 Hugoton field gas wells supplying natural gas to the new plant

rich-oil feed to the still, the fired heater superheats steam for absorption-oil purification and for other processing operations. Lean oil from the still after giving up some of its heat via exchange with the rich oil is further cooled in another set of exchangers with water and is then delivered to a surge tank for recycling.

Nearly 22,000,000 B.t.u. of heat design basis is removed per hour by aerial-type condensers in still overhead line. Approximately 23,000,000 B.t.u. heat removal is accomplished per hour with water in conventional tubular exchangers for the other operations of condensing and cooling. This duty is also on a design basis. Heat input to operations via transfer apparatus is slightly more than 30,000,000 B.t.u. hourly and interchange of heat runs upwards to 62 million B.t.u. per hour, both of which are also on a design basis.

The still, a 20-plate column 8 ft. by 53.5 ft. high, receives its charge from the heater at approximately 500° F. A dewatering tray is located in the upper section of the column between plates 15 and 16. Water drawoff at this point is accomplished with a 2 by 6-ft. drip tank and liquid-level controller. Cleanup on absorption oil is made by slip stream from the bottom of the still.

A recompression operation is performed on vapor from the still overhead receiver. Condensate from the recompression suction scrubber is returned to the overhead receiver tank by pressuring with vapor from the recompressor discharge accumulator. Gas make from the recompressor accumulator is recycled to the absorbers.

The recompression equipment consists of two units, one steam driven, the other powered by gas expansion. These units are arranged such that one cuts in automatically when the discharge volume of the other is below processing demands. For example, the unit powered by gas expansion operates continuously under normal vapor make from the overhead receiver at speeds dependent on the plant's consumption of fuel gas. Consequently under conditions of high vapor and low plant fuel consumption the gas-expansion-powered unit does not have adequate capacity to compress the vapor produced. When such conditions exist the steam-powered unit is automatically cut in and remains in operation parallel with the gas-powered unit until the factors bringing about its operation have returned to normal. Steam-driven unit operates only when excess vapor volume is greater than that which can be handled by the unit powered with expanding gas.

Condensate from the recompressor discharge accumulator is charged to the depropanizer along with liquid from the still overhead receiver. Before entering the depropanizer column the stream is heated by exchange with the debutanizer bottoms and with steam in the depropanizer feed preheater.

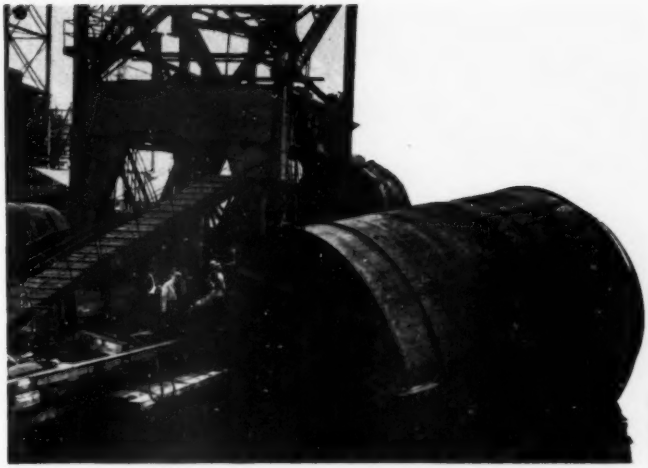
Normal operation of the depropanizer is such that no overhead liquid product is made. Only enough overhead is condensed to supply reflux for the column. All vapor not condensed for reflux is delivered to pipe line. This operation is maintained automatically by a liquid-level controller in the reflux tank which operates to by pass the condensing operation as needed. A 30-plate vessel, the depropanizer is 4 ft. in diameter by 71 ft. high. Propane may be cut from the column's twenty-eighth plate if desired since the surface of the reflux condenser is designed to allow for refluxing highly volatile materials.

The debuntanizer receives its feed from the depropanizer bottom and yields as net overhead L.P.G. products. Natural gasoline is bottom product from debutanizer. By heat exchange with other process streams and by cooling with water the gasoline stream emerges at 90° F. Design flexibility permits the debutanizer to be operated to debutanize to 26-lb. R.v.p. natural gasoline. This column, 4.5 by 83 ft., is equipped with 36 plates.

Provision is made for obtaining a

(Continued on page 49)

Socony-Vacuum Gets New Vacuum Unit

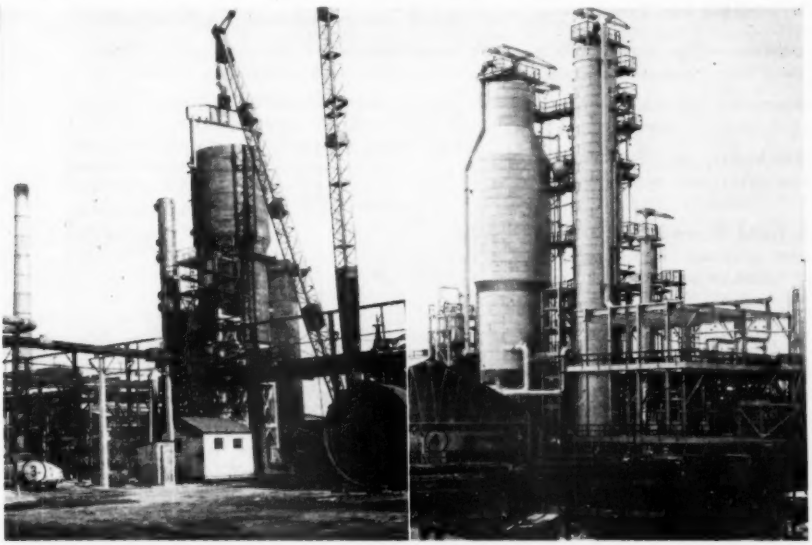


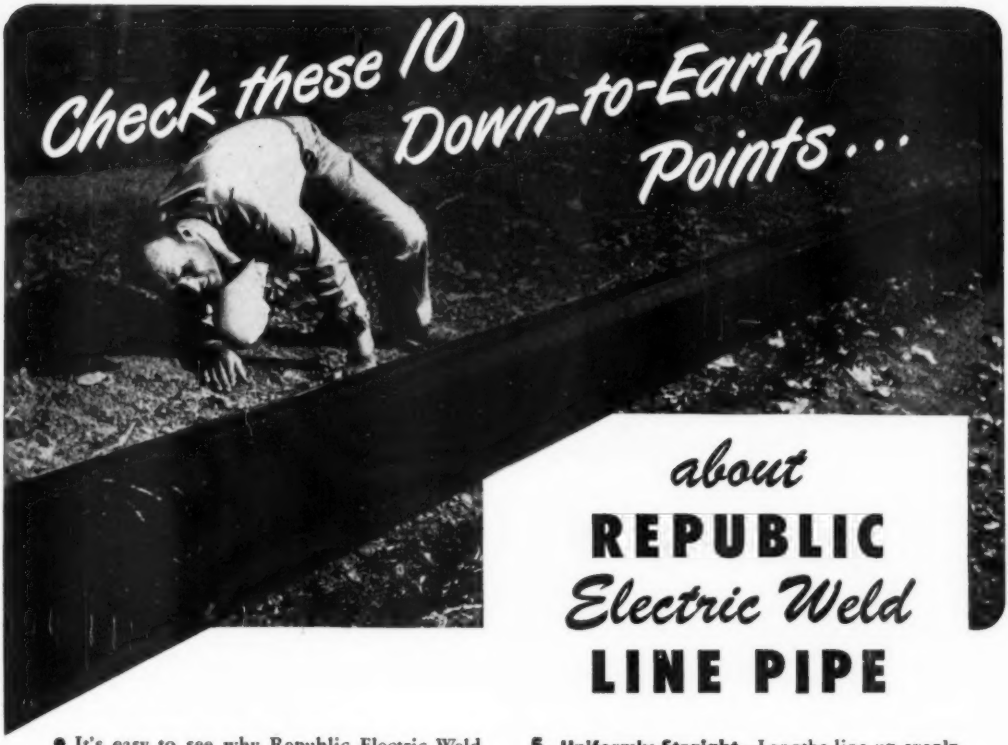
THESE photographs illustrate the recent construction of a new vacuum unit at the Paulsboro, N. J., refinery of Socony-Vacuum Oil Co., Inc. The vessel was fabricated in three sections in the plant of Sun Shipbuilding & Dry Dock Co. in Chester, Pa. The sections were bulkheaded and towed across the Delaware River to the Paulsboro site.

The combination atmospheric-vacuum unit, contracted by E. B. Badger & Sons Co., Boston, is a part of a major expansion program nearing completion at the Paulsboro refinery *(The Oil and Gas Journal, July 28, page 344)*. The unit is rated at 19,500 bbl. per stream day charge, and together with modifications in other process equipment will raise the refinery's capacity from 36,400 to 64,000 bbl. daily.

Fig. 1 shows the intermediate section of the vacuum tower being launched for water shipment at Chester. In Fig. 2, the top section is being towed across the river to the bank for movement to the location of the unit. Fig. 3 shows the erection of the intermediate (center) section. The completed unit is shown in Fig. 4.

Dimensions and sizes of the sections taken across the Delaware River follow: top section — 37 ft. 2½ in. long, 14 ft. and 23 ft. 8 in. diameter, 84 tons with bulkhead; intermediate section — 58 ft. 7⅛ in. long, 23 ft. 8 in. and 20 ft. 4 in. diameter, 115 tons with bulkheads; bottom section—48 ft. 4 in. long, 20 ft. 4 in. and 9 ft. diameter, 77 tons with bulkhead.





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● It's easy to see why Republic Electric Weld Line Pipe goes in the ground fast and gives you long, trouble-free service. This *combination* of ten basic advantages is the reason. And, for this same reason, more than 51,000 miles of Republic Electric Weld Line Pipe have been placed in service over the past twenty years, carrying crudes, gasoline, natural gas and by-products.

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2. **Uniform Diameter**—No "off-size" lengths to cause welding difficulties at joints.
3. **Uniform Wall Thickness**—Absolute dependability throughout every inch of length and circumference.
4. **Uniform High Yield Strength**—Permits building of higher pressure lines—utilizing design values to fullest advantage.
5. **Uniformly Straight**—Lengths line up evenly—go into the ditch freely.
6. **Easy to Bend**—High-ductility steel makes bending in the field easy.
7. **Easy to Weld**—Low carbon steel welds readily—makes sound joints.
8. **Freedom from Scale**—Insures against clogged valves, contamination of petroleum products.
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10. **Inspected Inside and Out**—Republic Electric Weld Line Pipe is made from flat-rolled steel, both sides of which are closely inspected. Thus, you are assured that the surface which becomes the inside wall when formed into pipe is free from hidden defects.

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HOW TO

Unitize an Oil Field

Here is actual procedure for unit operation in Louisiana as followed by Barnsdall Oil Co.

Unitization at Longville, Louisiana

THE unitization of oil and gas fields is a prime requisite for pressure-maintenance operation, either by gas or water injection. Unit operation also offers many attractive economic possibilities as to reductions in capital investments, operating costs, etc. The legal framework and beforehand engineering work of unitizing oil properties, however, can often be somewhat complex. Successful unitization requires an active understanding and cooperation among the royalty owners, the petroleum engineers, oil-company management, and legal counsel.

Barnsdall Oil Co. has developed an interesting teamwork procedure in unitization. For example, Benton field* and West Tepetate field† in Louisiana were unitized through agreements and orders which were obtained by their new procedure.

The accompanying article is of unusual interest, for two reasons. In one section will be found a highlight description, step by step, of the procedures developed by Barnsdall in proceeding with a specific unitization project (Longville, Louisiana, oil field). Another section gives results obtained from subsequent pressure maintenance, via water injection. The account starts with an actual "on-the-spot" recording of Barnsdall's formal hearing on its application for approval of the unit-operation agreement at Longville field. This public hearing was before the Louisiana Department of Conservation. In the following account some shortening and editing has been done in the interest of reading time.

Reference Articles Published by The Oil and Gas Journal

*"Benton Unit Approaches the Ideal Pressure-Maintenance Project," by George Weber, January 11, 1947, p. 56.

*"Benton Field Unit—A Standard Cooperative Enterprise on Unitization of Gas-Condensate Properties," by W. L. Horner and E. G. Trostel, March 4, 1948, p. 77.

*"Benton Unit Cycling Plant" by H. W. Manley, August 19, 1948, p. 82.

†"West Tepetate Field—First Dually Pressure-Maintained, Completely Unitized Field in the United States," by W. L. Horner and C. W. Ziemer, March 10, 1949, p. 78.

THE PLACE: Association of Commerce Building, Lake Charles, La.

THE ACTION: Public hearing before Department of Conservation of Louisiana on the application of Barnsdall Oil Co. for unitization of the Longville oil field.

THE PRINCIPALS: Hon. S. L. Digby, commissioner, Department of Conservation, State of Louisiana; James M. Cunningham, executive assistant for department; Thomas M. Winfiele, chief engineer for department; Leo W. Hough, Louisiana state geologist; George B. Holden, petroleum engineer for department; Arsene P. Edwards, Conservation Department district representative; Frank Fava, Conservation Department district representative; M. D. Kirk, vice president and counsel for Barnsdall Oil Co.; W. L. Horner, chief engineer, Barnsdall; also for Barnsdall appeared A. J. Shepard, C. D. Crites, H. L. Geis, C. W. Ziemer, H. E. McGlasson, and K. Lindley; Harry H. Shutts, civil engineer, F. Shutts' Sons (surveyors); A. R. LeCompte, L. L. Swafford, and Martin G. Miller, all representing Long Bell Lumber Co. (royalty owner); and S. Arthur Knapp, representing W. E. Walker (royalty owner).

Commissioner Digby: The hearing will please come to order.

(The legal notice of the hearing was then read.)

Cunningham: I wish to introduce and file in evidence as State Exhibit-1 the application for the hearing on Barnsdall Oil Co.'s petition for unitization; also State Exhibit-2, the original of the legal notice just read; State Exhibit-3, proof of publication of the legal notice in the Baton Rouge State-Times; State Exhibit-4, mimeographed copy of the legal notice, copies of which were mailed to parties and operators herein involved.

Commissioner Digby: All right, gentlemen, the applicant may proceed with the hearing.

Kirk: Mr. Commissioner, my name is M. D. Kirk. . . . I represent Barnsdall Oil Co. in this hearing. The Long Bell No. 3 Zone was first discovered in Longville field, Beauregard Parish, Louisiana, in . . . .

(Here follows a description of the field's discovery, development, performance, and unitization plan.)

At this time I desire to offer in evidence the unitization agreement for Long Bell No. 3 Zone, Longville field, Beauregard Parish, Louisiana.

Commissioner Digby: Let it be filed.

Kirk: As the first witness for the applicant, I desire to call C. D. Crites.

C. D. Crites, having been duly sworn as a witness by the commissioner, testified as follows:

Kirk: What were your duties, Mr. Crites, in connection with Longville field?

Crites: I circulated the unitization agreement among the various royalty owners.

Kirk: How did you ascertain the names of the royalty owners to whom you were to submit this agreement?

Crites: I took the names from our division order records, which are kept up to date in the Tulsa office, and from which all payments are made to the royalty owners in the field.

Kirk: Why are those division orders obtained? And how are they gotten out?

Crites: When the field is put on production, we submit to reputable attorneys the abstracts which have been brought down to date, and those attorneys give us what is known as a division order opinion. That shows the ownership on the date that the opinion is written. Then we circulate the division orders among the various owners of record, and in the event that there is a change of ownership, we submit what is known as a transfer order which transfers a certain interest to another party, and thereby our records are constantly up to date on the present ownership of the minerals or royalties in each field from which we produce oil.

Kirk: As a matter of fact, Barnsdall has had that done in this case because it is the purchaser of the oil in the field; is that correct?

Crites: That's right.

Kirk: From the data obtained, Mr. Crites, is it your opinion that you have obtained a complete list of the royalty owners in the field?

Crites: I am convinced of that, yes.

Kirk: Now, Mr. Crites, will you tell us what you have done in circulating this unitization agreement for execution, and by that I am referring to Exhibit-1, which has just been introduced in evidence?

Crites: Well, my first job is to contact the royalty owner in an attempt to explain to him the value of unitization, and ask for his cooperation; and I have been more or less successful in that in this instance. I have obtained the signatures of a number of royalty owners, which will represent a little over 94 per cent of the equity percentage in the field. (Within 5 months after this hearing, 100 per cent of royalty ownership had signed.)

A. J. Shepard, Jr., having been duly sworn as a witness by the Commissioner, testified as follows: I am an attorney at law, practicing in Lake Charles, La. I examined for Barnsdall Oil Co. the titles to all of the lands in the proposed unit, with the exception of a 20-acre tract. . . .

(Testified as to the correctness of the exhibit as concerned with ownership, and the legal status of the leases within the unitization agreement.)

W. L. Horner, having been duly sworn as a witness by the Commissioner, testified as follows: I am an engineer of Tulsa, employed as chief engineer of Barnsdall Oil Co. My professional qualifications, briefly, include over 20 years of petroleum engineering practice, specializing in pressure maintenance and secondary recovery in various fields of the United States. . . .

I have furnished all of the data obtained from testing wells and drilling wells in Longville field, Beauregard Parish, and I have directed the engineering operations in the field and have made a complete and thorough study based on these factual data. . . .

I have also made predictions of the behavior of the field and the amount of recovery to be obtained from the field with pressure maintenance, and have compared such predictions with predictions of recovery of oil and gas from the field if pressure maintenance is not instituted.

(Horner testified that preparation of most exhibits was done under his supervision. Among the exhibits introduced were: A list of descriptions of leased tracts and equity percentages for leased tracts, reduction of original survey map, reduction of original base map, unit area map, description of unit area, list of acreage of each leased tract, idealized cross-section, electric log, and predictions and histories of performance.)

Kirk: We desire to offer in evidence Exhibits Nos. 2 to 19, inclusive.

Commissioner Digby: Let them be filed in evidence.

Harry H. Shutts, having been duly sworn as a witness by the Commissioner testified as follows: (After stating qualifications as a civil engineer.) Starting in 1946, Barnsdall Oil Co. employed my firm, F. Shutts' Sons to make its well locations in this field. By making these well locations, we have made a complete survey of all of these sections in which they have these well locations. . . .

Exhibit-3 is a print of an original tracing prepared in my office for Barnsdall Oil Co. which combined the various surveys of the sections and townships as shown on the exhibits. . . .

Kirk: Do you certify to the accuracy, of the location of the section lines, the location of the wells, and the acreage in the various tracts as shown in Exhibit-3, Mr. Shutts?

Shutts: I do.

H. L. Geis, having been duly sworn as a witness by the Commissioner, testified as follows: I am employed by Barnsdall Oil Co. in the capacity of district geologist at Houston, Tex. . . .

(A statement of qualifications and experience was given. In explaining his contact with Longville field, Geis said his work began with the seismic surveys. He then verified a subsurface structural map of the Long Bell No. 3 zone. Geis went on to describe the geology of the field, fault trends in the area, and the method of interruption used in the field. He also explained the significance of an idealized cross-section map of the field and a Schlumberger log of one well in the field.)

Dr. Charles W. Ziemer, having duly sworn as a witness by the Commissioner, testified as follows: (After giving his name, employment, and qualifications.)

Under Mr. Horner's direction, I prepared reservoir engineering studies to make recommendations to improve the efficiency of production, so as to obtain maximum recovery of oil from this field.

I was in charge, under Mr. Horner's direction, of preparing and assembling the data from which the equity percentages were calculated, and in the preparation of an engineering report.

(In explaining calculation of equity percentages, Ziemer said the first procedure was to obtain an accurate map from which to work, for determining the amount of productive oil sand under each tract. Ziemer went on to explain the calculation of equity percentages, the significance of the various maps and exhibits presented at the hearing. He also testified concerning the necessity for a unitization program in the field under discussion, and the results of such a program.)

W. L. Horner, recalled as a witness, testified as follows:

The Long Bell No. 3 Zone in Longville field is highly permeable, having an average permeability of about 1,500 md. It is uniformly permeable throughout, as evidenced not only from the core analyses but the high productivity of the individual wells, and the uniform distribution of pressure, which is the most uniform that I have seen in any field. It is ideally suited for transmission of pressure throughout the field, or for transmission of injected energy throughout the field. To that extent, it is ideally suited for pressure maintenance. The porosity is uniform throughout the field, and is of high value, approximately 30.5 porosity.

Kirk: In your opinion, Mr. Horner, is the entire Bell Long No. 3 Zone encompassed within the boundaries of the unit area as shown on Exhibit-5, and as described elsewhere in other exhibits that have been introduced?

Horner: Yes sir, it is all encompassed. It is proved by the geological testimony, and affirmed by the pressure behavior, pressure tests made in the various wells in the field, and one well in a similar zone outside of the unit area, which shows that all of the production within the unit area is in a continuous reservoir and does not extend beyond the unit area.

(Here followed an interpretation of a performance-history graph of the producing zone, an explanation of the method of pressure maintenance—water injection—to be used in the field, the reason for this method, and the mechanical aspect of the flood itself. Testimony on the necessity for the use of a unitization program was given, and more justification for the equity percentage calculation was presented. A similar pool was cited as an example of pool unitization.)

Martin G. Miller, having been duly sworn as a witness by the Commissioner, testified as follows: (After giving his qualifications as a petroleum engineer.)

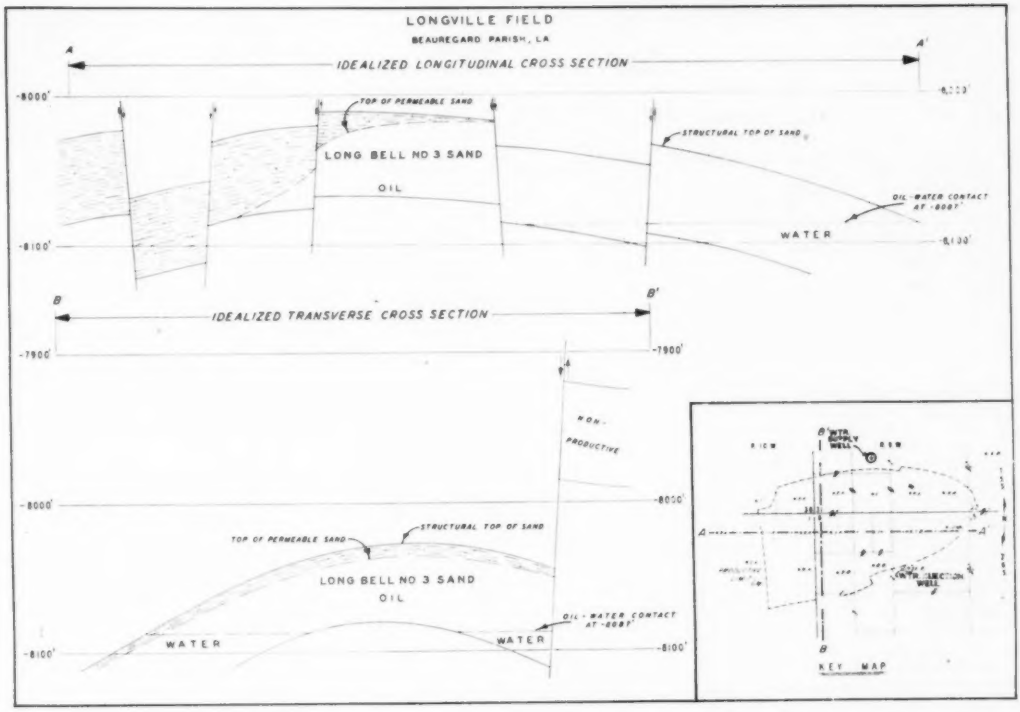
I am a member of the firm of J. R. Butler & Co. (employed by Long Bell Lumber Co., a large royalty owner in the field), oil and gas consultants, Houston. We are of the opinion that the ultimate recovery of the field will perhaps be doubled by the application of the proposed pressure maintenance operation.

We are of the opinion that it is necessary to unitize the field in order to distribute equitably the production that would ensue from the pressure-maintenance operations. We are of the opinion that the proposed basis of unitization is eminently fair.

H. E. McGlasson, having been duly sworn as a witness by the Commissioner, testified as follows:

At the request of the Barnsdall Oil Co., I worked up the data and computed the equity percentage in order to be in position to advise any of the royalty owners who might wish to consult me regarding their interests in the field. I believe that pres-

(Continued on page 49)



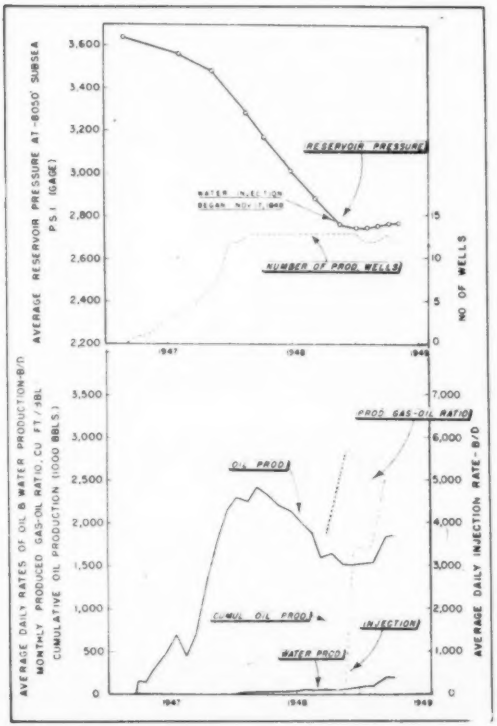


Fig. 1—(Above) Cross-sections of the field, and map showing location of water supply and injection wells

Fig. 2—Charts of reservoir data: note improvement in performance quickly following water injection

Details of Unitization and Pressure Maintenance Operations at Longville

by W. L. Horner

THE Honorable S. L. Digby, Commissioner, Department of Conservation, State of Louisiana, speaking on the Longville unitization and pressure-maintenance program, has proclaimed it "an ideal application of unitization and water injection," and pointed out that because the Longville program was started early and handled efficiently, the operation would improve the productive life of the wells and increase the ultimate recovery of oil from the field. The accompanying exhibits on this page and the next illustrate some of the main points involved in the Longville reservoir, the unitization of the field, and its operation to date under pressure-maintenance program via water injection.

Productive formation in the Longville field is topped at approximately 8,000 ft. (see Fig. 1). The oil sand thickness varies from zero at the productive limits of the field to a maximum of 46 ft. Reservoir factors, past production and future reserves for Longville are listed in Table 1.

Principal operator, Barnsdall Oil Co., commenced water injection for experimental purposes very early after the field was discovered. A total of 18 wells has been drilled, of which 14 are producers in the Long Bell No. 3

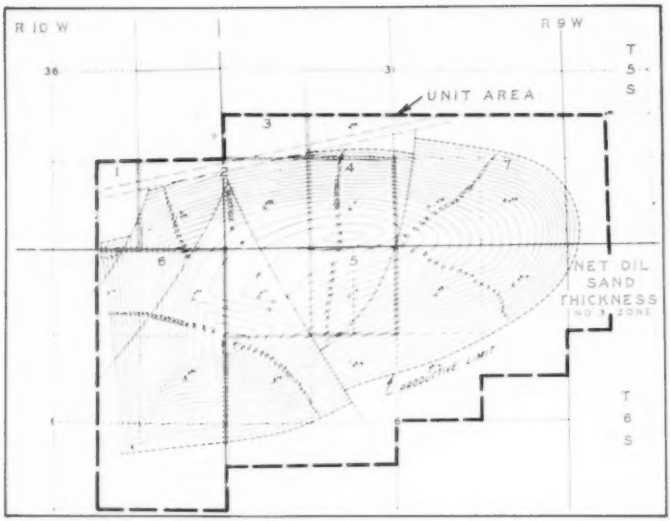


Fig. 3—Isopach map of Longville field

zone and 4 are nonproducers in that zone. There is now one water injection well (No. 15) in operation (for location see Fig. 1) and one water-supply well (No. 14); these wells were converted from the offstructure nonproductive wells that were drilled.

Good Results Obtained

Remarkable results from the unitization-pressure maintenance program have been obtained, as reflected by bottom-hole pressure surveys and reduction in produced gas-oil ratios (see Fig. 2). The original bottom-hole pressure (8,050 ft. subsea) was 3,631 psi. By the time 976,000 bbl. of oil had been produced, the reservoir pressure had dropped to 2,746 psi. However, by that time, facilities for the water injection program had been installed and a start made by the injection of 137,000 bbl. of water. Continued injection of water, however, then began to raise the reservoir pressure. In the next 6 months an additional 841,000 bbl. of water was injected (to July 1, 1949). This was responsible not only to arrest completely the previous rapid decline in bottom-hole pressure but actually to reverse the trend of 700-psi. loss per year and raise the reservoir pressure to 2,771 psi. Water injection is made below the oil-water contact in the Long Bell No. 3 zone. The gas-oil ratios of wells completed in this zone have also shown a marked decrease since the inception of the program. They declined from 2,911:1 in October 1948 to 1,958:1 in January 1949, and to 1,672:1 in July 1949. As termed by Commissioner Digby, the foregoing features of performance are practically ideal.

(A portion of the geological and engineering data presented herein is to be submitted in a thesis for the partial fulfillment of the requirements for the degree of geological engineer, University of Pittsburgh, by W. L. Horner.)

The author is chief engineer for Barnsdall Oil Co., Tulsa. A leading authority on pressure maintenance, he is credited with pioneering work in using water injection for this purpose in deep, high-pressure fields, and was responsible for engineering the first project of this kind at Midway, Ark. (also several other subsequent similar projects). Horner graduated from University of Pittsburgh in 1928. He worked with Humble Oil & Refining Co., Forest Oil Corp., and was vice president of Core Laboratories, Inc., before joining Barnsdall in 1942 as manager of the secondary-recovery department.

TABLE 1—LONGVILLE FIELD, LOUISIANA, LONG BELL NO. 3 ZONE—FACTORS USED IN EQUITY PERCENTAGE DETERMINATION

Porosity, per cent	30.5
Connate water, per cent	39.0
Average permeability, md.	1,512
Hydrocarbon space, bbl./acre-ft. sand	1,443.38
Stock-tank oil initially in place per bbl. reservoir space	0.4675
Initially recoverable stock-tank oil, bbl./acre-ft. sand	404.876
Total acre-ft. productive sand	11,466.34
Total oil initially recoverable, bbl.	4,642,444
Production stock-tank oil to 7-1-48, bbl.	658,821
Fraction remaining recoverable 7-1-48	0.858087

TABLE 2—LONGVILLE FIELD, BEAUREGARD PARISH, LOUISIANA, LONG BELL NO. 3 ZONE—TABULATION OF VOLUME OF OIL SAND AND EQUITY PERCENTAGES

Tract No.	Acre-ft.	Equity (%)
1	18.40	0.16047
2	2,814.74	24.54785
3	0.53	0.00462
4	934.22	8.14750
5	1,019.25	8.88906
6	2,396.82	20.90310
7	4,282.38	37.34740
Total	11,466.34	100.00000

Summary Description of General Procedures Used by Barnsdall Oil in Unitization Work

1. Assembly of all well and reservoir data.—This includes collection, analysis, and proper tabulation of all well records, completion data, core analyses, electric logs, detailed production history of oil, gas and water, bottom-hole pressure surveys, well-productivity indices, analyses of reservoir fluids, etc. Laboratory, geological, and field research is directed to obtain factors and values required to estimate reserves under various operating methods.

2. Assembly of ownership data.—This includes the accurate surveying of the field (lease lines, well locations), reduction to suitable working-size maps; the tabulation and legal confirmation of all lease and royalty owners and their interests; an analysis of any unusual lease and royalty stipulations.

3. Reservoir engineering studies.—Thorough investigations are made of the field from this standpoint. Mathematical calculations are made of material balance. Computations of the amounts of natural water influx are made for various possible producing conditions; sometimes an electric pool analyzer study is made. The predicted reservoir performances are set up under various future producing and

injection methods and schedules. Laboratory, geological, and field studies are used in the determination of reserves, producing rates, and pressures under various methods for operating: Gas injection, water injection, ordinary depletion, etc.

4. Production-engineering and equipment studies. — Various field-production plans may be followed, according to whether the field is unitized or not unitized and whether a pressure-maintenance program is or is not to be used—thus these alternatives will call for different investments in field equipment (number of wells to be drilled, type of producing equipment at wells, number of separators, tank batteries, gas compressor or water-injection pressure plants, etc.). The various possible alternative producing programs are defined and the applicable estimated future yearly operating expenses are set up for each.

5. "Economic balances" as for alternative producing plans.—A combined examination of preceding Items 3 and 4 may show that unitization will obtain more ultimate production and greater gross and net revenues to the participating operators and royalty owners. Schedules of future production, revenue costs, and net returns are set up on the basis of unitization and nonunitization, for various possible types of pressure maintenance operations, etc.

6. Discussion and agreement among lessees.—When the foregoing tabulations of data and engineering studies are completed, a meeting is scheduled with all lessees represented in the field. Presentation of the data and alternative producing plans are made and discussions held re different factors involved in the proposed unitization. Lessees may agree to support the findings of an independent engineer or geologist or appoint an engineering subcommittee to compute equity participation in the field for all lessees and royalty owners. This work proceeds and additional meetings are held until an acceptable unitization and operating agreement is prepared and executed by the lessees. At one of the meetings one of the lessees is selected to be the unit operator and to represent the lessees.

7. Informal discussion with state regulatory body.—At this point the operator's engineer and attorney discuss informally with the commissioner and staff of the state regulatory body the past work on the unitization project. Advice and suggestions are solicited from the state commissioner and his staff.

8. Explanation of plan to royalty owners. — Frequently, each of the lessees is delegated to explain the unitization plan to the royalty owners for his various tracts. Usually it is preferred to have the operator contact all royalty owners. This may take the course of one or more informal meetings at selected convenient localities. After the details have been presented, an agreement for royalty owners' participation in the unitization plan is submitted as soon as possible to each royalty owner for signature.

9. Formal hearing before state regulatory body.—Request is made by the operator on behalf of all lessees for a formal hearing and date is set by the commissioner, and notices issued to all lessees and royalty owners. At this hearing full details and all data regarding the reservoir, proposed unitization program, and plans for future operation are presented for final approval and authority by the state body concerned.

(For actual details on a state hearing of this kind held in Louisiana, see accompanying material in this article.)

How to Unitize an Oil Field

(Continued from page 46)

sure maintenance—there is no doubt about it—is surely needed.

If the present conditions are allowed to continue, it is my opinion that not over 40 per cent of the recoverable oil will be recovered.

It is recognized that, in order to carry out any method of pressure maintenance, the field would have to be unitized, to insure that all of the interested parties would get their equitable and just share.

I think water injection would be the most feasible method of pressure maintenance.

I have checked Barnsdall's work (in computing equity percentages) and also made an independent computation. I think their figures are unusually accurate. . . . I believe it to be the fairest method that could be used.

Kirk: Mr. Commissioner, this concludes our evidence in this matter, and as a result of the introduction of this evidence we request that an order be issued providing for the unitization of this field and the authorization of a complete field-wide system of pressure maintenance in this Long Bell No. 3 Zone.

Commissioner Digby: Is there any statement or testimony to be submitted in connection with this hearing, other than that which has gone into the record? If not, the hearing will be closed.

(Subsequent to the above hearing, Commissioner Digby for the Louisiana Department of Conservation issued order No. 156 for the unitization of Longville field and authorized use of water injection for pressure-maintenance purposes.)

Stano Absorption Plant

(Continued from page 42)

butane-rich side cut which may be used to replace propane in the residue gas in maintaining its specifications on heating value when maximum-vapor-pressure L.P.G. is being produced. The general scheme involves a receiver pot for the side stream, a pump, and a vaporizer. The pump serves to inject the vaporized butane side cut into the residue gas stream. A manifold hookup of the injection pump to the debutanizer overhead product line permits injecting the L.P.G. product into the residue line by shutting down the side draw. Prior to running to storage the natural gasoline is caustic washed and then sweetened in Perco treaters.

Storage facilities for natural gasoline and L.P.G. products at the Stano plant include seven horizontal vessels. Loading into highway or railway tankers the plant's products is made at points immediately adjacent to the plant.

Steam-generating equipment for operations at the Stano plant consist of two 35,000-lb.-per-hour boilers. All steam-driven equipment operates at 400 psi. 100° F. superheat. The recompressor and boiler feed water pumps exhaust at 20 psi. whereas the other equipment exclusive of the boiler plant exhausts at 110 psi. The 20-psi. exhaust steam and excess 110-psi. steam are utilized in the plant's deaerator and evaporators. Condensate is returned to the boiler feedwater system at approximately 40 psi. Stripping steam for the still is superheated in the direct-fired preheater. Electricity is supplied by three gas-engine-driven 500-kw., 480 - volt, 3-phase, 60-cycle generators.

Water cooling is carried out with a two-cell, induced-draft unit designed for circulating 3,000 g.p.m. Makeup water is treated with sulfuric acid, an algaecide, and corrosion inhibited. Raw water is obtained from two wells capable of producing in excess of 750 g.p.m. Two 5,000-bbl. vertical tanks are used for water storage. Water for fire fighting is supplied with two 750-g.p.m. pumps.

Office and housing facilities located on the plant site consist of one building containing six offices and a laboratory and five houses. Design and construction of the plant were by Jones & Laughlin Supply Co., under supervision of Stanolind's construction department.

BOOKS

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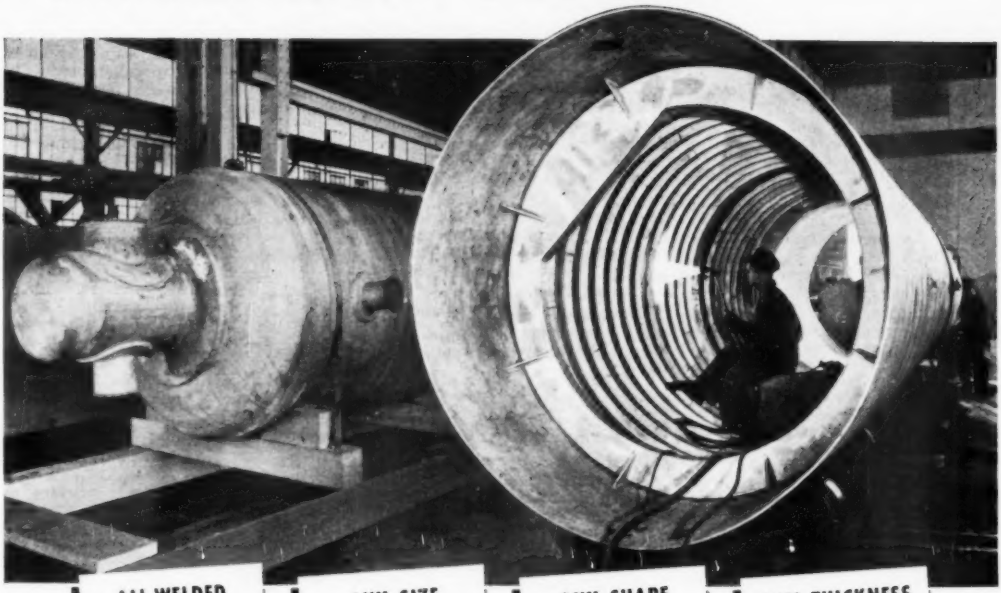
Aluminum Vessels



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METAL FABRICATORS

Permian basin operators finding this new material useful in combating lost circulation—Tests show 90 % success

by D. H. Stormont

Ground plastic, an ungraded sample of which is shown above (inset), weighs about the same as 10-lb. drilling mud. The particles have a high compressive strength and, being angular in shape, tend to bridge easily to plug the thief zone. The large picture shows mixing truck with trailer load of plastic plugging material on location at a well in the Kermit area of West Texas. Circulation has been restored at some wells within 4 hours after the truck reached the well site

GROUND plastic is the newest material being used by Permian basin operators to combat lost circulation—the loss of drilling fluid to highly porous or abnormally low-pressure "thief" formations. To date the plastic filler has been employed at 30 wells in West Texas and Southeastern New Mexico; it was successful in restoring mud circulation in about 90 per cent of the applications.

The action of the plastic filler material is purely mechanical, the particles filtering out on the face of the thief zone to form an effective base for building up an impermeable mud seal. Number of stages required to decrease the permeability of a particular zone, as well as the size of the plastic particles used, depends upon formation conditions encountered in each well. At some, circulation has been restored with only one treatment; drilling was resumed within 4 hours after the trucks arrived on location. In other wells several treatments were necessary before drilling could be resumed.

Lost circulation has long been a problem to operators in this area because the loss usually cannot be anticipated. Over the years many millions of dollars have been spent in attempting to restore circulation and numerous wells have had to be abandoned when these attempts failed. This region is especially trying because circulation may be lost at almost any depth after reaching the Red Beds underlying the surface sands. Lost circulation is frequent in the upper Permian formations, and in most all zones between the lower Permian and Ordovician lost returns may be encountered.

Cavernous conditions found in some formations may be so severe as to make it impossible to restore mud circulation. An outstanding example of such cavernous systems is in the Fusselman pay at Dollarhide, where caverns as much as 14 ft. deep have been encountered.

The degree to which circulation may be lost, of course, depends upon conditions encountered in the individual well. In some instances drilling fluid may be lost so slowly that returns can be maintained through mixing of additional mud and increased rate of circulation. At others, cavernous conditions are encountered so that the "bottom falls out of the hole"; the drilling fluid level may drop 1,000 to 1,500 ft. and remain there despite increased circulation rates. When this condition is encountered steps must be taken to seal off the thief zone before drilling can continue.

Once circulation is lost the general practice has been first to condition

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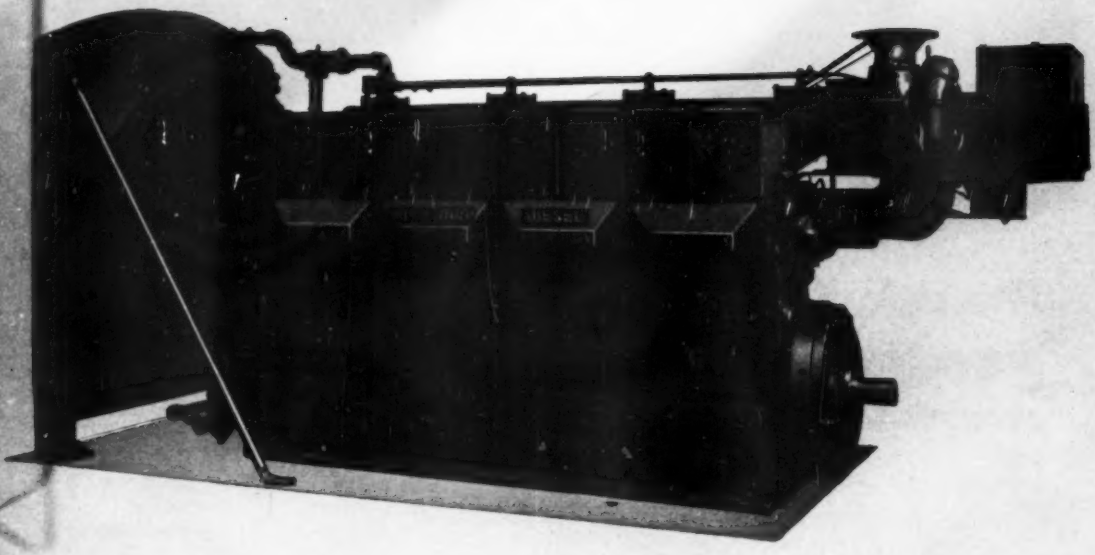

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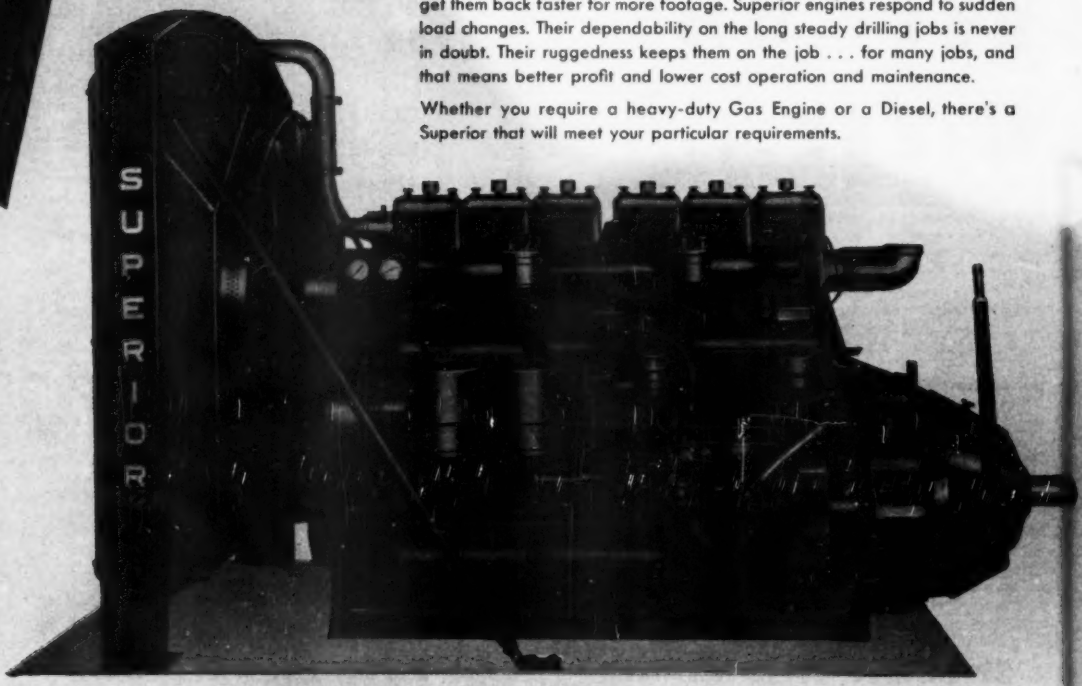

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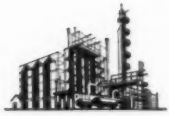

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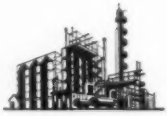

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the mud carefully and then add fibrous bulk materials. These materials, such as cottonseed hulls, strips of cellophane, redwood bark, or prairie hay, are added to form a mat over the formation taking the mud. With the mat established, colloids in the mud then filter out to form an impermeable sheath over the mat and thereby prevent further loss of mud into the thief zone.

Use of these fibrous materials quite often will restore circulation, but in many wells cementing is often necessary to stop mud losses. Or, as in some of the extreme cases in Dollarhide field, "dry" or "lost circulation" drilling is required when large caverns are found. With this method, drilling is continued without any return of mud until some 200 ft. of hole is cut below the cavern. Casing then is run and the cavern sealed off, above and below, by a five or six-stage cementing job. *(See The Oil and Gas Journal, p. 66, April 7, 1949).*

Properties of Plastic Material

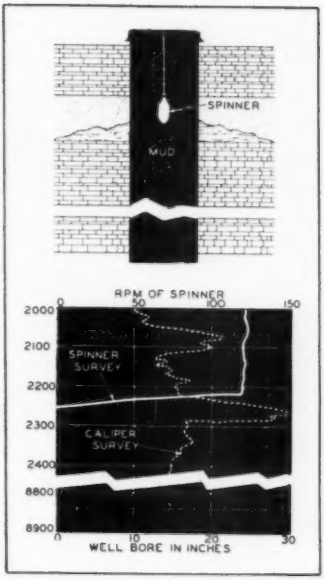
Ground plastic being used for restoring lost circulation has a specific gravity of 1.2, or it weighs about the same as 10-lb. drilling mud. This property makes the material easily mixed with the mud, and when mixed permits it to remain suspended in the mud. Since the plastic particles are inert they have no effect, detrimental or otherwise, on the drilling mud.

As far as has been ascertained the compressive strength of the plastic material is higher than any other material currently being used for combating lost circulation. It is fairly hard, and being a ground substance the particles are angular in shape. Because of their angularity, particles bridge very easily and plug the porous sections of the formation.

The plastic, which is produced by Dowell Incorporated, is supplied in grades varying from ½ in. in diameter to extremely fine particles. The size or sizes of materials used for a particular job depends upon the percentage of mud being lost. For example, if a 75 per cent mud return is being obtained, a regular grade would be used. If 100 per cent mud loss is being had, the extra-coarse or ½-in. grade would be used.

For mixing the filler material with the drilling mud and for pumping the mixture down the well, Dowell uses truck-mounted, high-pressure pumps. The pumps are equipped with special ball valves so that large particles of plastic will not prevent the valves from closing.

When the plastic plugging material is to be used at a well losing mud returns, first efforts are to locate the depth of the thief zone. At some wells the depth of the mud-taking zone may be known, but in many instances mud is lost in open hole at some unknown depth. In these wells Spinner surveys are run to locate the exact depth or depths of circulation loss.



Typical application of Spinner survey, and resulting log, in locating zone in which mud losses are occurring

In order to utilize the instrument (consisting of a housing in which a freely rotating propeller is mounted on pivots) in such application, the drill pipe is pulled from the hole and the Spinner lowered into the well. The rig pump then is started, pumping at a constant volume, and the survey started. As the propeller is rotated by the flow of fluids past the stationary assembly, each rotation is recorded at the surface by means of an electrical counting machine contained in the instrument housing. Thus, as is shown in the accompanying diagram, the point (or points) at which mud is lost to the formation is readily detected.

Once the exact depth of the thief zone is known, remedial treatment with the ground plastic can then be started. Before beginning, however, a bit with a full-size nozzle is run if this already has not been done. The large-size nozzles, of course, are to permit the free passage of plastic particles.

If the mud in the pits is in good condition and of the right weight it is used in the mixing tanks on the trucks. It is necessary that the small volume of mud used to mix with the plastic be of good quality, but the condition of that in the hole or pits does not affect the service in any way. In West Texas a mud weighing about 10 lb. per gallon has been found to be the most desirable for mixing with the plugging material.

The grade and volume of plastic to be used in the first stage depends primarily upon the volume of mud being lost and the depth of the well. As an example, in an 8,000-ft. hole having a 25 per cent mud loss, about 1,200 to 1,800 lb. of plastic might be used in the first batch.

In running the mud plastic mixture into the hole the rig mud hogs are used to pump mud to the mixing tanks on the trucks. There the plugging material is mixed with the mud and pumped down the hole by the high-pressure truck pumps. The rig pumps then pour sufficient mud into the hole to fill the annulus, and a bradenhead squeeze is applied. The amount of pressure employed depends upon formation conditions, but generally pressures from a few hundred to 1,500 psi. are placed on the fluid column.

If the first stage does not successfully restore mud circulation a second batch is run down the well. Percentage of plugging material used in this stage, and in any succeeding treatments required, is dependent upon the results obtained in the previous stage. Usual practice is to follow the plastic material with several barrels of high-viscosity mud if loss of fluid to the thief zone is to be completely stopped.

Treatment with the lost-circulation material is considered successful if circulation is reestablished and the well can drill ahead. Another thief zone may be encountered immediately, as has happened in a number of instances, so that the process has to be repeated. Or for some reason or other after the well has drilled deeper, mud losses may reoccur in a zone which had been plugged earlier.

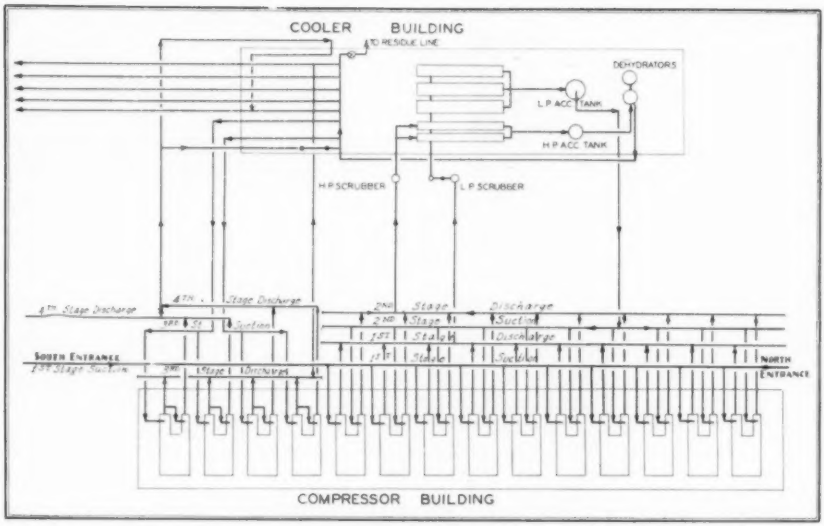
For example a formation which has been sealed off may start taking mud because the driller runs the drill pipe too fast into, or out of, the hole. If pulled too fast a suction may be caused which will drag the filler materials from the plugged zone. If the pipe is run too fast into the hole, the resultant pressure set up may break down the seal over the thief zone.

Example Applications

That good penetration of material into the thief zone is had is illustrated by a wildcat drilled between Shafter Lake and Fullerton fields of Andrews County. The well began losing circulation when a thief zone was drilled at 7,595 ft. In the first stage treatment 1,800 lb. of ground plastic was pumped down the hole and a 300-psi. pump pressure applied. This treatment did not wholly restore circulation so it was followed by a second stage of 1,375 lb. Circulation was completely restored by this application.

Drilling was resumed and after cutting 683 ft. of 6¼-in. hole, circulation was again lost when another porous zone was drilled. To seal off this formation 1,360 lb. of plastic, mixed in a

(Continued on page 65)



Flow diagram of Sinclair's compressor station in Lost Soldier field, Wyoming. This four-stage plant furnishes gas for a fuel system, pressure maintenance, and gas lift of wells in the field. Gas lifting has been carried on for nearly a quarter of a century

Lost Soldier Compressor Plant Supplies Gas for Three Different Operations

by Roy F. Carlson
District Editor

A SIMPLE but extensive gas-lift system, in operation for nearly a quarter century, is installed in Lost Soldier field which is operated by Sinclair Oil & Gas Co. Essentially the system consists of small holes bored at calculated intervals along the tubing string, through which the lifting gas passes from the annulus into the oil column in the tubing. A pressure-maintenance project also receives gas from the compressor station supplying the gas-lift installation and a field gas-fuel system.

Pressure maintenance is being carried on in the Tensleep sandstone, probably the most prolific of more than eight pay zones found in the field. This pay alone, with little more than 1,000 acres extent, is estimated as being capable of producing about 75,000,000 bbl. or nearly 75,000 bbl. per acre.

There have been two separate pressure-maintenance programs in effect in this field, the first of which began operation December 23, 1941, and continued until February 1, 1946, and the program now in effect which began operation on May 1, 1949. Much of the same plant has been used for both injection projects with the exception of four recently acquired compressors. An accompanying graph illustrates the production and injection history of this first pressure-maintenance program.

During the first pressure-maintenance program, of more than 4 years' duration, pressure in the field dropped only 109 psi. while production amounted to a total of 7,040,000 bbl. Gas-oil ratios remained relatively steady, with occasional minor variations. A total of 1,175,851 M.c.f. of gas was injected during this first operation. Production before pressure maintenance was nearly 3,000,000 bbl., this being produced with a field pressure drop of more than 600 psi., nearly 5,000 bbl. per psi. pressure drop. With the pressure-maintenance program, the average production was 64,587 bbl. per psi, pressure drop.

Gas for repressuring is taken from the gas-distribution system which also supplies fuel for the Sinclair refinery at Sinclair, Wyo., and is composed of residue gas from all producing horizons and dry gas from nearby fields. The volume of gas injected varies with the volume available after refinery and other fuel demands are met. Naturally, the injection volume in winter is low because of high fuel needs. Gas is injected into the sand through one well.

At the beginning of the second injection program there was a daily average production from the Tensleep of 2,550 bbl. per day. Average reservoir pressure was approximately 970 psi., and produced gas-oil ratio was 40 to 1. About 350 M.c.f. per day are available from the plant for pressure maintenance. The plant has a total capacity of 5,500 M.c.f. per day, most of which is used for gas lifting. In this plant, as an incidental operation, some natural gasoline is manufactured—about 9,000 gal. per day.

Plant Description

Winter operation of the plant is beset with many difficulties, the foremost being hydrates and subsequent freezing of surface lines. All gas that is processed in the plant for both gas lift and for pressure maintenance is dehydrated between the second and third stages of compression. Alcohol pots are placed in surface lines to fight hydrates and all fittings are carefully located for accessibility and efficiency in draining lines and the treating of freezeups. Except in extremes of cold, about 5 gal. of alcohol are used for 400 M.c.f. of gas. Indirect heaters are also used to heat the gas as needed.

As shown in the accompanying flow diagram, the compression plant re-

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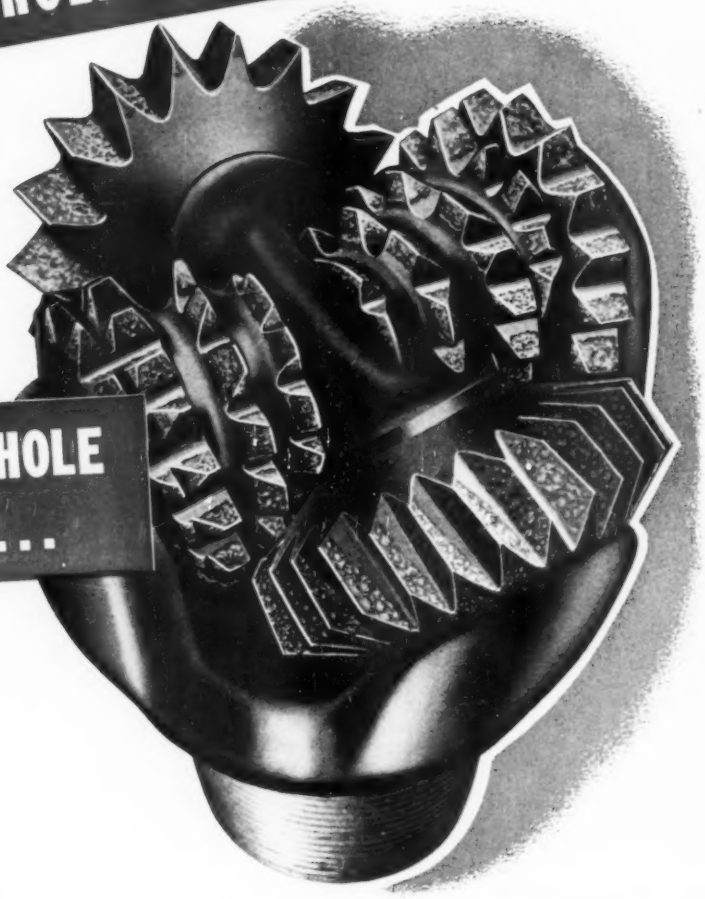

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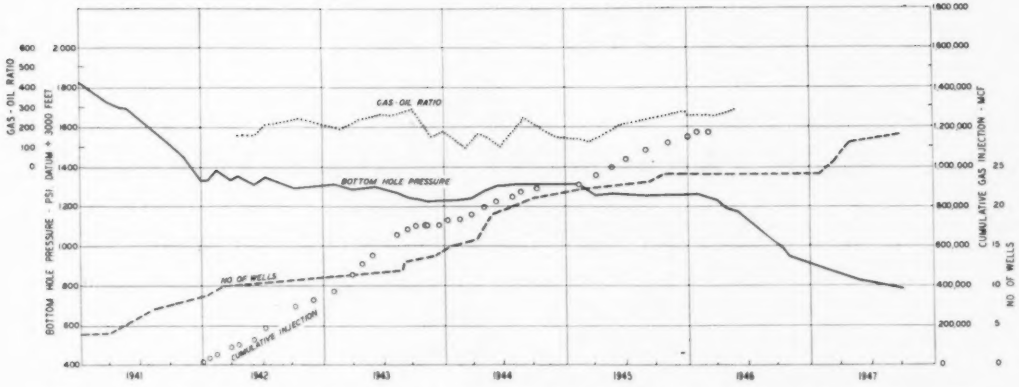


Performance curve for the first gas-injection program in Lost Soldier field. Pressures were maintained well during the operation

cei es gas from two directions. The supply line is of 12-in. diameter, feeds directly to the low stage of the compression plant, and operates under field pressure.

The compressor station has 14 horizontal two-stage engine-compressor units, 10 of which are used for first and second-stage compression, the remainder being used for compression to the third and fourth stages. Gas from the second, third, and fourth stages is used in the field for gas lifting, injection gas for the Tensleep being taken from the fourth stage. Compressors for the first two stages are double acting, while those for the second two stages are single acting. All are direct connected to the power units.

Maximum capacity of the high stage of compression is 4,500 M.c.f., of the low stage, 6,000 M.c.f. Changes in volume requirements are met by operating varied numbers of the compressors in parallel. Gas is scrubbed and cooled between the first and second stages of compression and passed through an accumulation tank before entering the second compression stage. First-stage discharge pressure is about 45 psi.

Second-stage compression raises the pressure to 250 psi. after which the gas is again cooled, scrubbed, passed through an accumulation chamber, and is also dehydrated. Some of this second-stage gas goes to the distribution system refinery. The remainder returns to the compressor house where it is raised to 450 psi. in the third compression stage.

Fourth Compression Stage

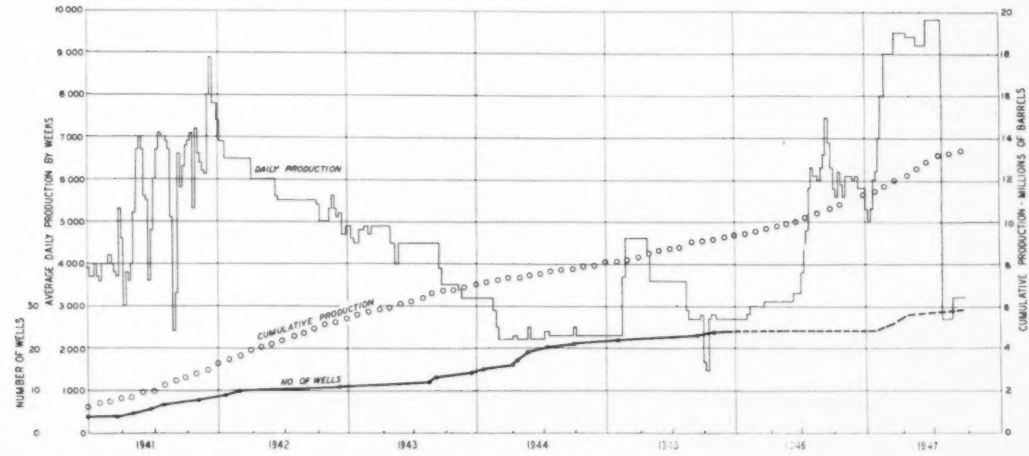
A part of the third-stage gas goes to gas-lift wells—two Tensleep wells, two Sundance wells, and one Madison well. The remainder of the gas is transferred to the fourth compression stage where it is compressed to about 600 psi. It is this high-pressure gas that is used for lifting three Tensleep wells, four Madison wells, and the two Cambrian wells; and for pressure maintenance in the Tensleep formation. Two of the high-pressure compressors are furnishing gas for the lifting operations, and two are supplying pressure-maintenance requirements.

Excess high-pressure gas is successively dumped through pressure regulators to lower pressure for distribution either to gas-lift wells or to the residue system, or it can be directed into underground storage in one of the Wall Creek sands for later use. The high-pressure system is manifolded so that gas may be transferred to any gas-lift well for kicking-off purposes.

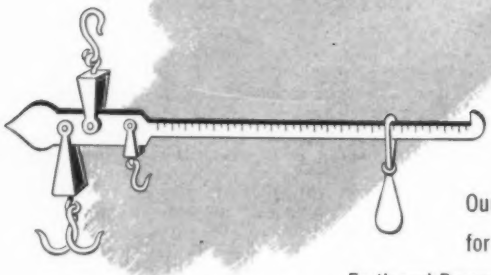
The gas-lift program is extremely simple and has served admirably in Lost Soldier wells. Some of the wells in the field have been gas lifted continuously since 1924. Gas lift in this field has not been designed primarily as a method of producing the wells but to assist natural flow. Especially in the Cambrian wells does

(Continued on page 65)

Production history for the prolific Tensleep pay zone. Surface area of the Tensleep is about 1,000 acres



How "heavy" is resourcefulness?



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QUESTIONS on TECHNOLOGY

by W. L. Nelson
Consulting Engineer

Diesel Fuel Blends—Pour Point

When two diesel fuel oils are mixed together what are the properties of the blends? Will the pour point be lower than it should be?—S. A. L.

The question implies that the pour point of a blend was lower than would be expected from the pour points of the two original stocks. If so, this is a different behavior from that reported elsewhere. Few data are available in the literature, but several writers imply that the pour point of blends that are free of asphaltenes or inhibitive agents behave in an additive manner. The only experimental data available to this department are blends made at University of Tulsa by Claude M. Murray, Jr., and reported in his master's degree thesis entitled, "Pour Point Depression of Diesel Fuels" (1947).

Table 1 shows the pour points of 11 experimental blends. The first 10 blends are substantially free from asphaltenes or inhibitive substances but the eleventh blend (cracked residuum) contains asphalt and it exhibits an entirely different behavior than the conventional blends.

The last entry in Table 1 shows the average deviation (°F.) in pour point from an additive behavior. Thus for Blend 7, the pour points of the two stocks are —3° and —40° F., and we might expect a 50:50 blend to have a pour point of —3° minus —37° ÷ 2 or —21.5° F. Actually the blend showed the higher pour point of —20° F. The question indicated a lower rather than a higher pour point. Note that the blends, except Nos. 1, 5, and 11 (No. 11 can be eliminated because it contains asphalt) exhibited higher pour points than would be expected from an additive behavior. Note also that the deviation increases as the spread between the pour points of the blending stocks increases. Thus, the wax in high-pour-point stocks apparently is not dissolved by the low-pour-point stock—rather, it seems that more wax (or at least a higher pour point) is produced.

Murray, in his thesis, suggests that if the spread or difference in pour point of the two blending stocks exceeds about 30° F., an empirical equation of the following form can be employed:

$$P_b = P_h - (V)^2 \Delta P$$

in which:

P_b = pour point of blend, °F.
P_h = pour point of high-pour stock, °F.
V = volume fraction of low-pour stock in the blend
ΔP = difference in pour point of the two stocks, °F.

However, the equation must only be considered as the proper general form of equation because it does not fit the data well. Much of the failure of the equation can be attributed to the inaccuracy of the pour-point test.

In conclusion, inhibitor-free blends of distillate-like materials usually have a higher pour point than would be expected from the pour points of the blending stocks. The increase in pour point is quite large if the pour points of the two stocks are far apart. Insufficient data are available for study of asphaltene or inhibited blends.

Cost of Lube-Oil Refinery

What is the cost of a refinery for making lubricating oils and waxes?—F. M. B.

Prices are just now beginning to recede from the high values attained after the year. Your question cannot be answered because inadequate information was given, and because plants vary widely depending on the crude oil being processed and the degree of refining that is desirable. Nevertheless, the following tabulation indicates most approximate prices of complete refineries including storage tanks, office, shops, utilities, etc.

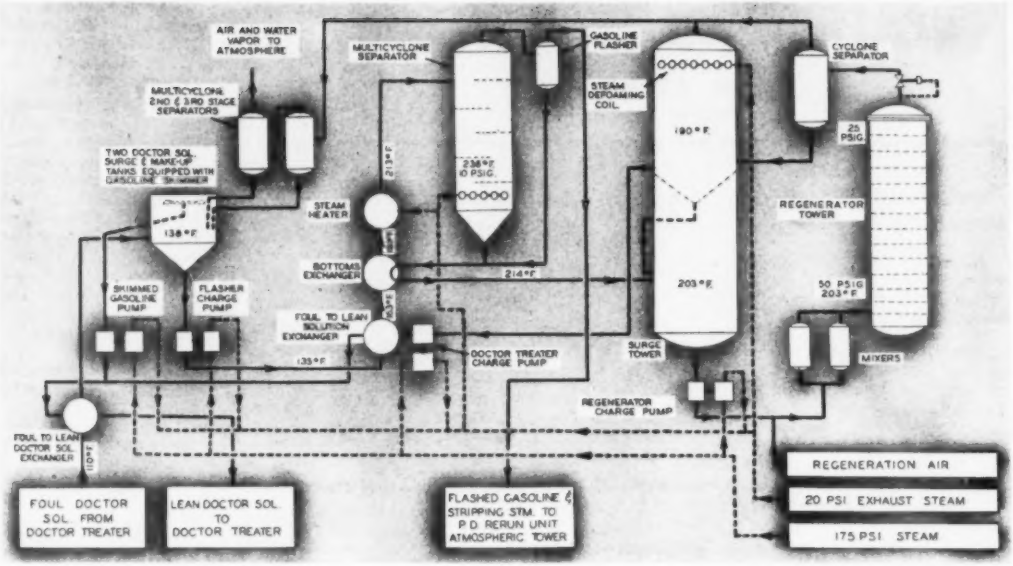
	$ per daily bbl.
(1) Topping only	340- 400
(2) Topping, solvent treating, and solvent dewaxing for lubes and wax	800-1,000
(3) Same as (2) but add thermal cracking	1,000-1,200
(4) Topping and thermal cracking	1,150-1,250
(5) Topping and catalytic cracking	1,800-1,900

TABLE 1—POUR POINTS OF BLENDS OF DISTILLATES

(Numbers in parenthesis are pour points computed as if they were additive)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Okla.-E. Tex.-S.R.	Mid-C. S.R.	Ark.-S.R.	Okla.-S.R.	Okla.-E. Tex.-Cr.	Okla.-Tex.-S.R.	Ark.-S.R.	Okla.-W.D.	Okla.-W.D.	Mich.-S.R.	Ark.-Cr. resid.
High pour A.P.I.	38.0	34.7	33.0	37.4	20.5		33.0	33.0	33.0	37.9	9.3
Low pour	Cat. cr.	Cat. cr.	Cat. cr.	Cat. cr.	Cat. cr.	Okla.-E. Tex.-S.R.	Calif.-S.R.	Okla.-S.R.	Cat. cr.	Ark.-S.R.	Cat. cr.
A.P.I.	32.1	32.1	32.1	32.1	32.1	38.0	33.4	37.4	32.1	29.0	32.1
Spread, °F.	16	16.5	17	19	29	33	37°	51	70	75*	75
0†	—4	—3.5	—3	—1	9	29	—3	50	50	30	55
20	—8(7.2)	—5.0(6.8)	—5(6.4)	—5.5(4.8)	4.0(3.2)	22(22.4)		48(39.8)	46(36)		28.5(40)
25							—12(12.2)			27(11)	
40	—12.8(10.4)	—9.5(10.1)	—8(9.8)	—9.0(8.6)	—5.5(2.6)	17(15.8)		40(29.2)	37.5(22)		—21.0(+25)
50							—20(21.5)			24(8)	
60	—12.5(13.6)	—12.0(13.4)	—11(13.2)	—11.0(12.4)	—12.0(8.4)	12(9.2)		31.5(19.4)	21.0(8)		—37(+10)
75							—26(30.8)			0(—27)	
80	—15.0(16.8)	—16.0(16.7)	—16(16.6)	—14.0(16.2)	—15.0(14.2)	0(2.6)		16.5(9.2)	9.0(—6)		—36(—5)
100	—20	—20	—20	—20	—30	—4	—40°	—1	—20	—45*	—20
Avg. deviation, °F.	0.1 low	1.1 high	1.5 high	0.3 high	1.6 low	0.2 high	2.2 high	9.6 high	14.4 high	25 high	33.9 low

*The pour point of the low-pour-point material was lower than shown because lower temperatures could not be attained in the laboratory. †Per cent of low-pour material in blend.



Process flow diagram for new unit, at Torrance, Calif., refinery of General Petroleum Corp.

DOCTOR SOLUTION *Regeneration Unit*

Under way at General Petroleum refinery

by Robert Harwick
District Editor

ERECTION of a new unit designed to regenerate doctor solution is now under way at the Torrance, Calif., refinery of General Petroleum Corp. The new plant will replace temporary facilities that were installed a few years ago during the critical lead shortage. Design of the installation incorporates several engineering features new to units of this type. While the basic method of doctor solution regeneration, i.e., heating and oxidizing with air, is not new, the manner in which the process is controlled is new.

Engineering plan for the regeneration unit begins with the treating operation itself. There are two steps in the treating procedure which provide for easier handling of fouled doctor solution. First, about twice the usual quantity of plumbite solution will be used per unit of sour gasoline. Second, the sour gasoline will be so handled in the caustic prewash that cresylic acids content will be reduced to a minimum. Net effect of these two steps will be to prolong active life of a unit of doctor solution and to cut down on foaming and priming by removing the cresylic acids which aggravate such conditions.

Most important feature of the regenerating unit is its closed-system design. Reaction is carried out in a closed vessel to eliminate as much as possible hazards of fire and foaming.

The 4 by 22-ft. regenerator in the new plant is unusual for equipment of this type. It is equipped with 16 orifice-type trays which are welded to four steel bars, set 90° apart and running the full height of the tower. The 16 trays are thus installed in the tower as a "bundle." When sulfides and other salts accumulate on the trays to a point where tray orifices become plugged, the flanged head is opened and the "tray bundle" removed. Once out of the tower, the trays are easily cleaned.

Just before entering the regenerating tower, air is mixed with the fouled solution. This is accomplished in parallel nozzle mixers set in the tower feed line. Pressure of air-fouled solution mixture on entering the regenerator tower is 50 psi. Pressure is maintained at this degree to improve air-solution contact when using smallest possible volume of air.

Design of Tower

The tower itself is designed to provide a relatively high pressure drop, about 25 psi. This drop through the "tray bundle" is a measure of the mixing produced by the orifice plates.

Design rate of the unit is 5,300 bbl. per day of fouled doctor solution from the refinery's gasoline treating section. Fouled solution passes through an exchanger where it is heated by regenerated solution, returning to the treating area.

From the exchanger, the heated fouled solution enters one of two 1,200-bbl. cone-bottom settling tanks. Here gasoline is continually removed by a floating skimmer. Skimmed gasoline returns to treating area through the regenerated doctor-solution line. Solution leaves bottom of the settling tank, passes through an exchanger bank where it is heated in turn by regenerated (lean) doctor solution from the surge tank, and by bottoms from the flasher. Solution is then heated by steam to enter flash tower at 213° F.

The 3 by 13-ft. flasher containing four baffle plates operates at 10 psig. Here, the last of the gasoline carried by the fouled solution is removed with the aid of stripping steam. Gaso-

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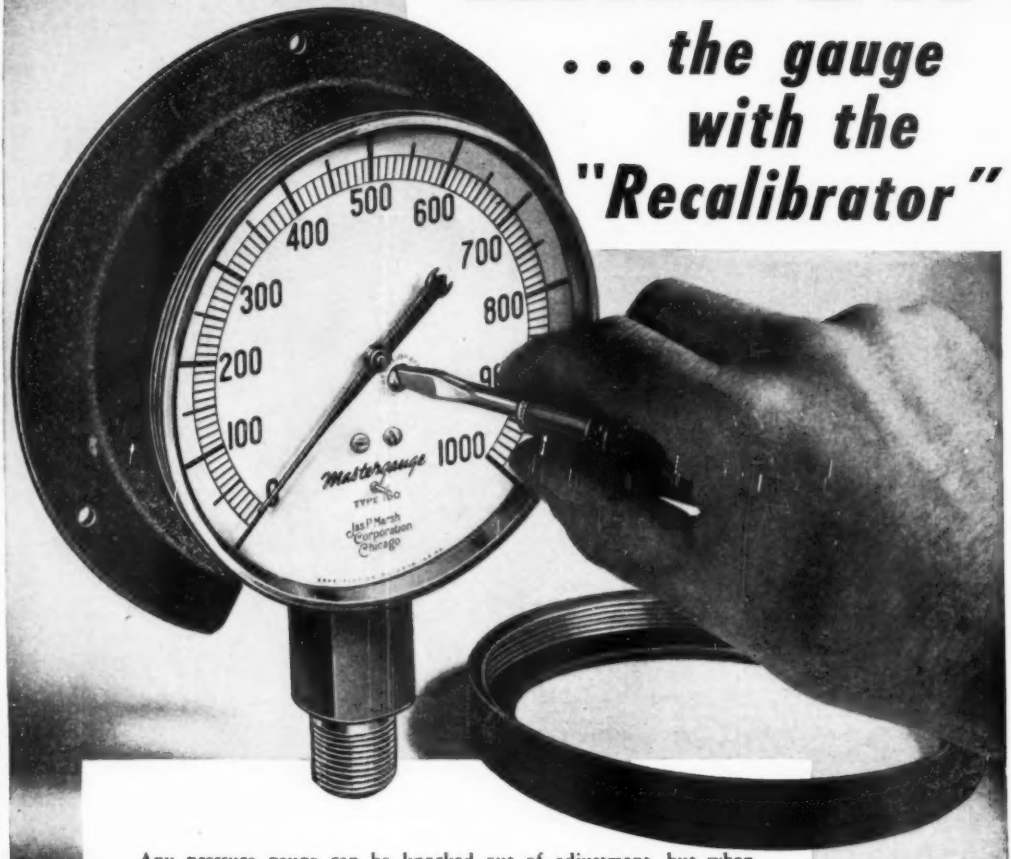

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line vapors from the top of the flasher pass through a multicyclone separator. A caustic disentrainment pot may also be used at this point. Recovered gasoline is charged directly to the atmospheric tower in a rerun unit.

The steam heater, through which fouled doctor solution passes before entering flasher, is designed with carbon-steel tubes for the first pass and nickel tubes for the second pass. Purpose of this change in tube metals is to avoid caustic embrittlement by fouled doctor solution at temperatures above 200° F.

From the bottom of flash tower, the gasoline-free doctor solution exchanges parts of its heat with the solution going to flash tower, and then enters a surge tank which is the lower section of a 7 by 52-ft. vessel. At this point flow rate is doubled and 10,000 bbl. a day is pumped from the lower surge tank, through nozzle mixers. The mixers add 1,000,000 cu. ft. of air per day to the stream prior to its entering regenerator tower. Here lead sulfide in the fouled solution is oxidized to sodium plumbite. Regenerated doctor solution leaves at top of the tower, passes through a pressure reducer, then through a cyclone separator and into upper section of the surge tower.

The mixture from the top of the first separator passes to two other separators where air and water vapor are removed. Liquids separated at these points flow to the settling tanks whereas vapors are discharged to atmosphere.

These multicyclone units for separating regeneration air from the regenerated doctor solution are incorporated into the process to minimize caustic entrainment in air released to atmosphere.

From the upper surge tank of the two-section vessel, flow of regenerated solution is divided into two streams. The stream from the bottom of the upper section, 4,700 bbl. per day, enters the lower surge tank along with 5,300 bbl. per day of fouled solution. The remaining 53 per cent of the 10,000-bbl.-per-day stream goes to the treating plant for use in the gasoline sweetening process.

Doubling the flow rate through the regenerator tower and employing a second 1,200-bbl. settling tank for holding or mixing fresh solution, permits shutdown without process interruption. With this setup, cleaning or repair operations can be performed without halting the continuous operation of the gasoline-treating plant.

Ground Plastic

(Continued from page 55)

ratio of 500 lb. to 6 bbl. of mud, was pumped down the hole and a surface pressure of 400 psi. applied. This application entirely stopped the mud losses.

The 683 ft. of 6¼-in. hole was then underreamed to a diameter of 7⅞ in. Plugging of the thief zone was not affected by the hole enlargement, indicating the particles of filler had been displaced well into the formation and were not just a surface seal.

An excellent example of the difficulties and expenses caused by lost circulation, as well as the effectiveness of the ground plastic as a remedy, was at another wildcat near Hobbs, N. M. The well was abandoned last June at a total depth of about 12,600 ft. This depth, however, was reached only after much trouble from a thief zone at about 7,300 ft.

Returns Lost at 7,272 ft.

Returns were first lost in a formation at 7,272 ft. while drilling with an 8.7-lb. mud of 100 viscosity. Fibrous materials, Aquagel, and Jelflake were first tried unsuccessfully, after which 1,500 sacks of cement were run in 15 stages and 300 additional sacks in a sixteenth stage. This restored circulation so that drilling proceeded to 7,424 ft. when the bottom again "fell out" of the hole. It was thought the trouble was due to the upper thief zone so that it was decided to use ground plastic to see if a better shutoff could not be secured.

In the first stage, 1,870 lb. of extra-coarse plastic was run after which a pressure of 450 psi. was applied. When mud circulation was resumed it was found returns were satisfactory so that drilling was resumed. After cutting about 10 ft., however, returns were lost again. This time 3,300 lb. of ground plastic was run and a 700-psi. pressure applied. The job was a failure because of the materials bridging over so that the bridge had to be cleaned out and another batch started down the hole. In this stage 1,800 lb. was used and a bradenhead squeeze pressure of 700 psi. applied. This application successfully sealed the formation.

After drilling to 7,749 ft., returns again were lost. The lost circulation occurred while running drill pipe so it was believed that loss was occurring in the 7,300-ft. zone. About 900 lb. of filler material was run in the first stage, a 600-psi. pressure applied, and after 1 hour the treatment was repeated. Circulation was restored so that hole could be carried to 8,674 ft. Here, again, mud returns were lost while running drill pipe but treatment with 2,424 lb. of plastic restored circulation and drilling resumed.

Upon reaching a depth of 9,234 ft. the drill pipe was stuck and in freeing it with oil and acid, circulation again was lost to the 7,300-ft. thief zone. To restore mud returns this time 900 lb. of plugging material was pumped down the hole and a squeeze of 700 psi. applied. Also 150 gal. of liquid plastic was squeezed into the thief zone. This successfully restored mud circulation and the wildcat was drilled to 12,626 ft. without further difficulty from lost mud circulation.

Lost Soldier Compressor Plant Supplies Gas

(Continued from page 59)

this idea apply, since those wells will flow naturally after being kicked off. Gas lift is applied to increase the daily rate and to conserve energy. Wells produced in this manner have an extremely high value of productivity index, oil flow being nearly continuous.

The lifting device itself consists of small holes bored in the tubing production string. These holes, initially 1/16 in. in diameter, are placed at predetermined intervals along the tubing, the first about 500 ft. below the static fluid level, the second about 500 ft. below this perforation. Near the working fluid level two or three of these perforations are made. Recently, after study of individual well behavior ⅛-in. perforations were placed at the working fluid level in some wells. These last perforations have resulted in a lowered operating pressure and increased efficiency and production from these wells.

The working fluid level in those Madison wells which are being gas lifted in about 3,000 ft. below the surface. The perforations which are placed in the tubing string serve to aerate and lighten the fluid column without the use of complicated differential pressure valves. They have given little trouble in the wells so treated thus far, the only disadvantage being occasional plugging. When the holes plug, flow of gas is temporarily reversed, and the hole flushed by reversed circulation of oil and gas. There have been no paraffin problems.

Input gas-oil ratios in the Madison gas-lift wells at a 600-psi. lift pressure are about 425 to 1 with a produced gas-oil ratio of 480 to 1. The one well in the Madison which is gas lifted by the third-stage gas has an input gas-oil ratio of 1,160 to 1. This well has not had the last perforation since it is to be placed on pump in the near future.

Kickoff of the Cambrian wells is accomplished easily since the wells will flow naturally after kickoff. In these wells, the pressure is built up by shutting in casing and tubing for a period of time. Release of tubing pressure will usually cause the wells to produce. Reverse flow is used in some of the Madison wells both to clean the ports and to build up head in the annulus for later normal flow of the produced fluid.

Pumping With Electricity

. . . in the Permian Basin

by W. D. Noel

IN the Permian basin of West Texas and New Mexico, fuel for power for pumping wells in a number of areas has long been an expensive and difficult problem. Until recently, approximately 90 per cent of the fields in the basin produced sour crude and sour casing-head gas. The hydrogen sulfide and sulfur content of this gas, in most cases, is extremely high, and in some instances, exceeds 10 per cent in volume.

This sour gas, as engine fuel, is expensive to the oil operator in repairs, replacements, and lost time, and as yet no economical method of treating gases of this nature and in small volumes has been developed.

In many of the older fields, such as World, Big Lake, McElroy, and McCamey, electricity for pumping oil wells is available to the operators from the various utility - company lines that serve these areas. The availability and the advantages of electricity, in these areas, have been a tremendous aid to operators of pumping wells. Because of good rates, extensive expansion of distribution facilities, and the excellent service offered by the electric power companies, a number of oil fields in West Texas and New Mexico are now pumped almost completely by electricity. McCamey field of Upton County, Texas, is an excellent example.

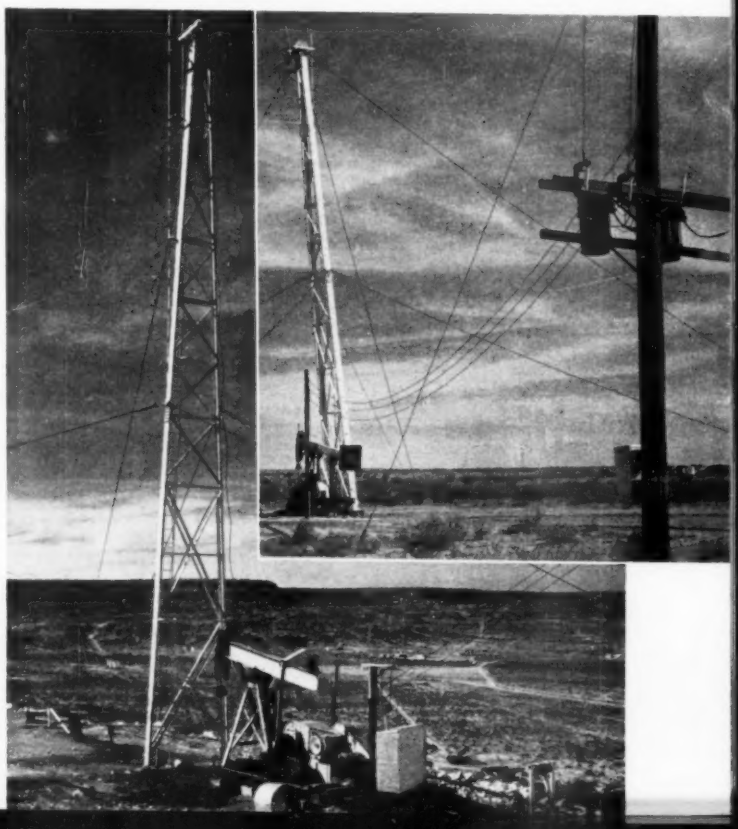
Low-Fluid-Level Wells

Many barrels of oil have been produced in McCamey field by pumping with electricity that, in the other methods of pumping, would not have been economically feasible. In McCamey, many wells are low-fluid-level wells, and the available fluid can be pumped out in a very short time. In such wells, the oil will accumulate to a certain height in the well bore, and beyond this point there is no further accumulation. It is, therefore, expedient to pump these wells intermittently.

The electric time clock, with adjustable lugs for starting and stopping the electric motor, is an excellent answer to the problem. Our company purchased a lease of this description about 7 years ago, and for the next 5 years the production from this lease was increased by approximately 300 per cent by careful intermittent pumping. In this case the wells were produced for 1 hour and shut down 2 hours—eight times each 24-hour period. On this lease there were two wells pumping from a total depth of 2,200 ft., making an average of 6 per cent water, and producing an average of 32 bbl. of oil per day. Cost of electricity to pump these wells intermittently, as described, was about $26 per month.

It has been the experience of many operators in McCamey field that the economies resulting from some electrical pumping installations will oftentimes pay the power costs. The installation of time clocks to automatically start and stop the wells eliminates a large number of the daily trips that a pumper must ordinarily make to each well. With automatic starting and stopping, it is possible to eliminate excessive fluid pounding, its resulting high costs, and in the case of a well that will pump completely dry and burn out the polished-rod packing, the well can be shut down automatically before this occurs. The continuous, smooth, and steady power delivery of the electric motor results in a minimum of wear, shock, and overload to the pump, rods, jack frame, bearings, and gear box.

Possibly the greatest economy from pumping with electricity is the savings that result from the reduction of the time and labor required to produce each well or lease. This is well illustrated by one pumper in McCamey field who pumps and produces 32 pumping wells, located on 5



In the larger picture is shown a 10-hp. electric motor pumping two 2,600-ft. oil wells in McCamey field. Inset: Secondary distribution lines and transformers from primary well pumping with electricity

The Author

W. D. Noel is president of Odessa Natural Gasoline Co., Odessa, Tex. Born in Fort Worth, he graduated in 1935 from the school of business administration, University of Texas. Following graduation he joined Gulf Oil Corp. in the production department. After working in the Panhandle and West Texas areas for Gulf, he resigned in 1940 to become an independent oil operator.

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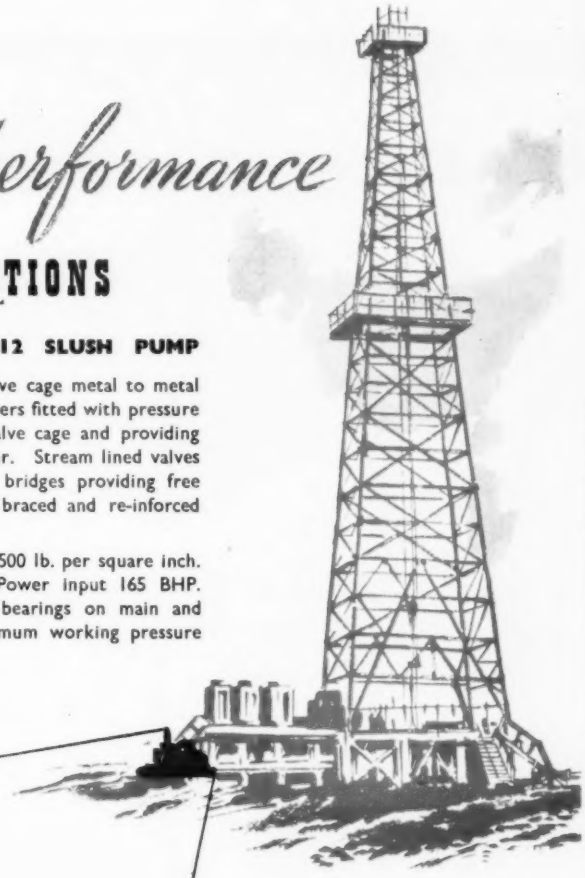

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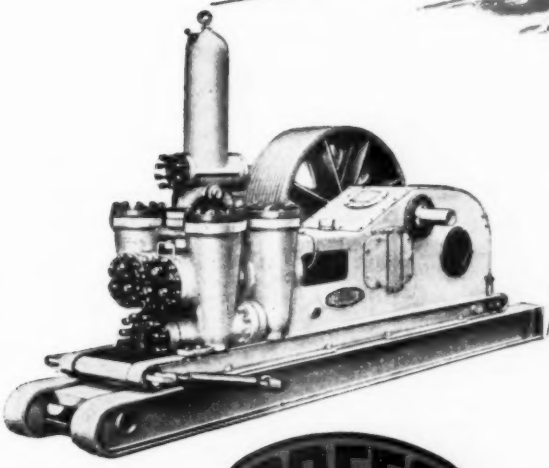

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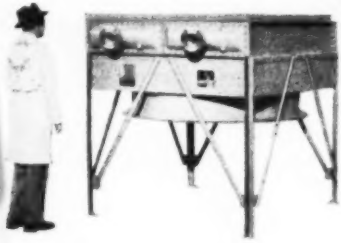

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different leases, and some of the leases are as much as 4 miles apart. These 32 wells produce approximately 700 bbl. of oil daily and 3,200 bbl. of water. Without electricity, it is estimated that three men would be required to pump the above leases.

On leases that produce little, if any, water in McCamey, and at depths ranging up to 2,700 ft., we have electrically pumped wells with a cost for power as low as 1.6 cents per barrel of oil delivered to the stock tanks. This was achieved by carefully staggering the producing hours of each well so as to create the minimum of demand for electricity at any time.

Large Amount of Water

In McCamey field there are a number of wells that produce large quantities of water along with the oil. In these cases there is an economic limit on how much water can be pumped with electricity. There is no set rule for determining how much fluid can be lifted profitably by electricity. Each well must be appraised individually. There are wells that have been profitably pumped with electricity that produce 700 bbl. of water and only 20 to 25 bbl. of oil daily. In other cases, wells making 300 bbl. of water and 10 to 15 bbl. of oil could not be produced at a profit.

A typical electric pumping installation in McCamey field usually consists of the following equipment that is owned and serviced by the oil operator: the weatherproof switch box, located close by the well and containing an entrance switch for 440 volts, three phase, 60 cycles; a magnetic overload protection switch, and often a time clock. Conduit and rubber-covered wiring extend from the switch box to the electric motor on the pumping unit. The electric motor is usually weatherproof in design, operates on 440 volts, three phase, 60 cycles, a.c. electricity, and revolutions per minute vary from 800 to 1,700, with 1,200-r.p.m. motors being most commonly used.

The utility company usually owns and services the secondary line and transformers serving the operator's lease. However, most utility companies offer a definite payout through lower rates to the operator who installs his own transformers and secondary high lines. Repair and maintenance of such facilities then become the responsibility of the operator. In cases where the operator does not elect to own and install the transformers and secondary high lines, cost of completely equipping a well to pump with electricity is somewhat less than installing conventional gas or oil engines.

At this point it might be added that the utility companies do a remarkably good job of repairs, maintenance, and service for their connections. The oil-field service department is on 24-hour duty, and repairs and restoration of service can be accomplished at any hour of the day or night. This service is of utmost importance to the small operator who is not able to maintain his own service and repair department. Because of such service, and because of the dependability of electricity, the operator pumping with electricity has no worry or problem with down time. Also, the utility companies maintain engineers who are available to advise the operator on purchasing, installing, operating, and maintaining his electrical equipment.

Cost of Electricity to Users

In buying electricity to pump oil wells, the operator will find that most contracts with the utility company are based upon the maximum demand for electricity at any one time, and the total amount of electricity used. The maximum demand cost will encourage the operator to distribute evenly the usage of electricity over the entire period of the meter reading. All price schedules for electricity, for pumping purposes, are based upon a decreasing rate as the consumption increases.

There are so many possibilities on rate schedules and the resulting costs to the oil operator, that it would be impossible to cover the field in this discussion. This information can be quickly obtained from the local utility company. From our own experience in pumping wells from 2,200 to 2,700 ft. in depth and with varying fluid levels in McCamey field, we have lifted the fluid for a low average cost of 1.1 cents per barrel to a high average cost of 2.75 cents per barrel. These figures indicate that pumping with electricity under the above conditions can be an economical way to produce oil.

When pumping oil wells with electricity, and with individual units, the operator is able to pump each well exactly as the background and experience of operating the well have indicated that it should be produced. Too, if the operator is producing oil in a field that is delivering its casing-head gas to a gasoline-plant gathering system, electricity and time-clock installations offer one of the most efficient methods of scheduling an even 24-hour flow of casing-head gas from the lease to the plant at no extra cost to the operator.

Records at McCamey indicate that the use of electrical energy in pumping operations has been efficient and economical. Of course, each field presents its own problems and these must be carefully studied before deciding which is the best method to be adopted. Electrical distribution systems are being constantly extended in the Permian basin and as the supply of electrical power increases, and as electrical materials become available, this method will be available to more operators who decide to adopt it for producing their wells.

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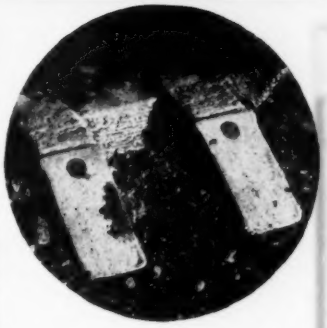

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Cost-imating

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

Fittings and Flanges

APPROXIMATE COST INDEXES*

	(1946 = 100) Cast iron	Mall. iron	Forgings
1926	55	67	75
1929 est.	56	73	78
1932	49		
1935	39		
1944	56	86	91
1945	57	90	92
1946	100	100	100
1947 est.	160	150	117
1948	194	168	135
1949 April	171	168	142

*Wholesale prices, Bureau of Labor Statistics, U. S. Dept. of Labor, but not entirely applicable to the particular materials on this page.

TABLE 1—APPROXIMATE COST (1946) OF FLANGES,* DOLLARS PER PAIR; AND UNIONS, DOLLARS EACH

	Cast iron (scr.)	Forged carbon steel (screwed)†					Mall. unions	
Size, in.	350 lb.	150 lb.	1,500 lb.	900 lb.	600 lb.	300 lb.	150 lb.	Std.	Extra hvy.
½								0.21	0.62
¾								0.25	0.76
1								0.33	1.00
1¼								0.56	1.30
2		1.00						0.82	1.47
3		1.25						1.98	4.15
4	2.50	1.45	210	150	98	40	26	4.10	8.90
6	4.00	2.20	360	250	155	67	43		
8	5.50	3.20	680	460	272	115	78		
10	8.00	4.60	910	600	335	150	102		
12	11.50	6.50	1,290	820	435	184	139		
14	15.50	9.00	1,840	1,150	575	264	192		
16	20.00	11.00	2,620	1,600	750	350	265		
20	27.50	16.00	4,800	2,900	1,270	610	480		
24	40.00	23.00	8,600	5,000	2,050	1,000	820		

*Faced and drilled. †Same cost for slip-on welding flanges. For welding neck flanges the cost is larger by factors of 1.3-1.4, but 1.6 larger for 600 lb.

TABLE 2—APPROXIMATE COST (1946) OF ELBOWS, DOLLARS EACH

	Malleable (screwed)*		Cast iron (screwed)†		Cast iron (flanged)‡		Alloy cast steel (flanged)§			
Size, in.	Std.	Ex. hvy.	400 lb.	175 lb.	350 lb.	150 lb.	1,500 lb.	900 lb.	600 lb.	300 lb.
½	.07	.10		.10						
¾	.08	.27		.10						
1	.11	.30		.15		4.30				
1¼	.19	.43		.20		4.30				
1½	.26	.54		.25		4.30				
2	.42	.69	.66	.34		4.30				
3	1.11	1.82	1.75	.90	7	4.90				
4	2.16	3.21	2.10	1.22	10	6.70	168	107	56	25
6	5.70	7.20	9.00	4.00	18	12.00	380	240	126	56
8			20.00	9.00	28	18.60	670	430	224	100
10			33.00	15.00	40	26.70	1,050	670	350	155
12			48.00	24.00	55	36.70	1,430	910	475	210
16					105	70.00	2,300	1,470	770	340
20					170	113.00	3,700	2,340	1,220	540

*Galvanized 30-50 per cent more. 45° ells about 20 per cent more. †45° ells about 20 per cent more. ‡Also ferrosteel. §Chrome molybdenum. For carbon molybdenum only 75 per cent.

TABLE 3—APPROXIMATE COST (1946) OF TEES, DOLLARS EACH

	Malleable (screwed)*		Cast iron (screwed)†		Cast iron (flanged)‡		Alloy cast steel (flanged)§			
Size, in.	Std.	Ex. hvy.	400 lb.	175 lb.	300 lb.	150 lb.	1,500 lb.	900 lb.	600 lb.	300 lb.
½	.10	.34		.11						
¾	.11	.38		.15						
1	.16	.47		.20		5				
1¼	.26	.62		.30		5				
1½	.34	.79		.35		5				
2	.56	1.02	1.20	.48		5				
3	1.31	2.72	3.20	1.28		6				
4	2.25	4.90	5.05	2.04	9	7	380	240	126	56
6	5.10	10.80	11.60	4.64	17	13	760	480	252	112
8			27.20	11.30	36	20	1,130	720	370	167
10			47.00	22.60	53	35	1,680	1,060	560	250
12			68.00	33.60	80	54	2,170	1,370	720	320
16					155	104	3,640	2,300	1,210	540
20					236	158	5,630	3,600	1,870	830

*Crosses are double. Galvanized are 30-50 per cent more. †Crosses are 30 per cent more for the 400-lb. class and 80 per cent more for 175-lb. class. ‡Also ferrosteel. Crosses are about 50 per cent more. §Chrome molybdenum steel. For plain carbon molybdenum only 75 per cent. Crosses cost 40 per cent more.

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Calculation of Phase Separation

THE illustration of a calculation of phase conditions in a system can best be made by reference to a two-component system. Consider, for example, a mixture of n-butane and n-hexane. In order to make computations, equilibrium-constant charts for these materials must be available. For the calculations below, constants are read from charts in the Natural Gasoline Supply Men's Association Handbook,[1] pages 66 and 70.

The following equations apply to the system being considered:

$$\text{y-butane} + \text{y-hexane} = 1.0 \quad (1)$$

$$\text{x-butane} + \text{x-hexane} = 1.0 \quad (2)$$

$$\text{y-butane} = \text{k-butane x-butane} \quad (3)$$

$$\text{y-hexane} = \text{k-hexane x-hexane} \quad (4)$$

Equations 3 and 4 can be added to give:

$$\text{y-butane} + \text{y-hexane} = \text{k-butane x-butane} + \text{k-hexane x-hexane}$$

Now, Equations 1 and 2 can be substituted in this expression to give

$$1 = \text{k-butane x-butane} + \text{k-hexane } (1 - \text{x-butane})$$

which can be rearranged to read

$$\text{x-butane} = \frac{1 - \text{k-hexane}}{\text{k-butane} - \text{k-hexane}} \quad (5)$$

Inasmuch as the k values are dependent upon pressure and temperature, this equation states that x-butane can be calculated by knowing the pressure and temperature on the system.

Let it be required to calculate the compositions of vapor and liquid containing these components which are in equilibrium at 200° F. and 100 psia. By reference to the equilibrium charts mentioned above, k-butane under these conditions is 1.75, and k-hexane is 0.325. Substituting in Equation 5 yields x-butane = .474. Therefore, from Equation 2 x-hexane = .526. By substituting the x and k values in Equations 3 and 4, y-butane is found to be .829 and x-hexane is found to be .171. As a check, these values add up to 1.0. Thus, it is found that at 200° F. and 100 psia. liquid composed of 52.6 mol per cent hexane and 47.4 mol per cent butane is in equilibrium with a vapor composed of 17.1 mol per cent hexane and 82.9 mol per cent butane.

This problem might have been reversed to ask what temperature and pressure would be required to allow 52.6 mol per cent hexane in a liquid containing only hexane and butane to coexist in equilibrium with a vapor of the same components having 17.1 mol per cent hexane. The solution would be attained by calculating k-hexane and k-butane from the x and y values given. Then by referring to the equilibrium-constant charts one could find by trial and error the pressure and temperature that would give the correct k value on both charts.

One can state the general problem in a fashion which agrees more nearly with the type information usually sought, as follows: The system containing only hexane and butane is at 200° F. At what pressure should separation occur to give a liquid that contains no more than 10 mol per cent butane? The values of x are x-butane = .10 and x-hexane = .90. The temperature is given as 200° F. so that the equilibrium constants vary only with pressure. It is to be assumed that the separation is an equilibrium one, and therefore Equation 5 holds. The problem is to find by trial and error on charts for the two equilibrium constants those values of k-butane and k-hexane which satisfy the equation. One can do this graphically by plotting the right-hand side of Equation 5 against pressure. The following table gives values of k as read from the equilibrium-constant charts, and the computation of the right-hand side of the equation.

Pressure	k-butane	k-hexane	(1 — k-hexane)	k-butane / k-hexane	Ratio
150 psia.	1.25	0.23	.77	1.02	0.754
100 psia.	1.75	0.325	.675	1.425	0.473
50 psia.	3.25	0.60	.40	2.65	0.151
40 psia.	4.05	0.75	.25	3.30	0.076

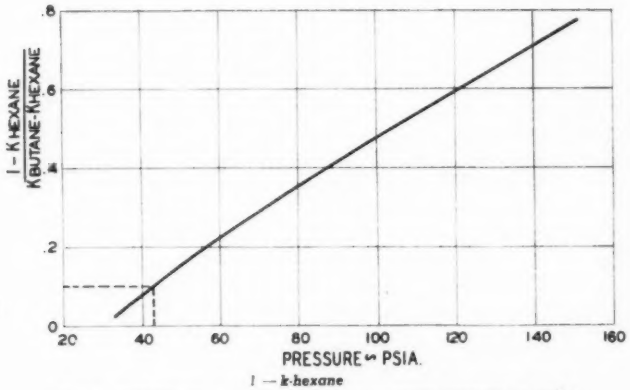


Fig. 1—Variation of $\frac{1 - \text{k-hexane}}{\text{k-butane} - \text{k-hexane}}$ *versus pressure at 200° F.*

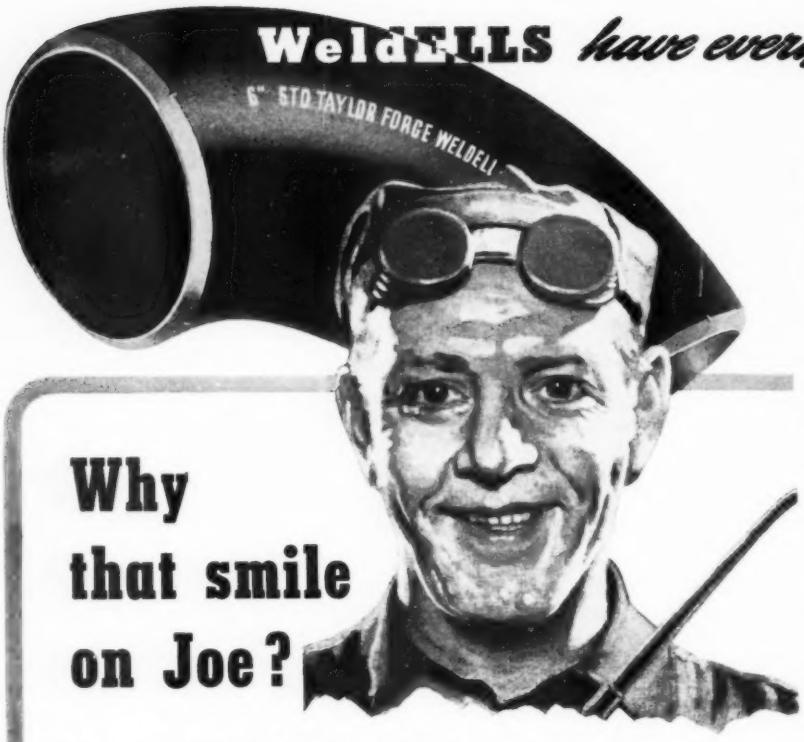
A plot of the ratio versus pressure in Fig. 1 shows that 0.10 is obtained at a pressure of 43 psia. This is the maximum separation pressure at 200° F. that would keep the liquid at 10 mol per cent butane or below. A separation pressure between 40 and 43 psia. would give a liquid in the range of 7.6 mol per cent to 10 mol per cent butane.

Reference

1. Natural Gasoline Supply Men's Association Technical Manual, Fifth Edition, Natural Gasoline Association of America, Tulsa.

Series by Dr. John C. Calhoun, Jr., Chairman, Petroleum Engineering School, University of Oklahoma

WeldELLS *have everything...*



Why that smile on Joe?

Joe may not know much about the engineered strength of WeldELLS, or the metallurgical control, or the greater scope of the WeldELL line. However, it is plain enough that these considerations which mean so much to you begin to lose meaning unless Joe does *bis* part of the job right.

That's why we designed WeldELLS, not only for you, but also for Joe. That's why Joe smiles: A good Welder like Joe takes extra pride in the kind of job he can turn out when it's made easy for him by these easily identified fittings, with sized end tangents, cleanly machined bevels, precision quarter markings to speed lining up, accurate key dimensions, plus other conveniences that are combined only in WeldELLS.

Yes, Joe does a better job with WeldELLS . . . and in the final analysis, *your* work rests on Joe's work!

Remember that the line which offers the most to both you and Joe, also contains the most complete range of sizes, thicknesses, and types of fittings, *and* in a complete range of materials. Convenient stocks are carried in all industrial centers.

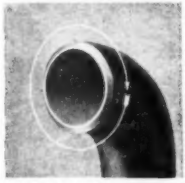
Note these features that appeal to the man on the job:

No guess-work; markings clear and complete.

Precision quarter marks mean a lot to the welder.

Extreme accuracy, uniformly maintained.

Sized end tangents.



Cleanly machined bevels.

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OIL AND GAS EQUIPMENT Digest

IT'S NEW CHECK IT

by Dan B. Miller

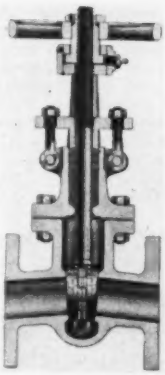
(1) BIROTOR METERS. These newly perfected petroleum meters embody many new and unusual features. Their design includes a complete and readily interchangeable measuring-unit assembly, comprised of two fully synchronized helical rotors which freely rotate in complete static and dynamic balance under all operating conditions. Has no reciprocating parts and no metal-to-metal contact of the spiral surfaces of the rotors. *Ralph N. Brodie Co.*

IT'S NEW CHECK IT

(2) SERIES A-88 PNEUMATIC INSTRUMENTS for transmitting and controlling flow, pressure, liquid level, and specific gravity. These instruments have been designed to provide accurate, dependable performance combined with simplicity and ease of maintenance. By unitizing subassemblies and standardizing parts, a high degree of interchangeability has been achieved. Other advantages include a positioning device which simplifies linkage alignment in the field; a spring-closing, bellows-sealed, reset valve calibrated according to time; and a nozzle assembly which permits adjustment of nozzle without breaking tubing connections. Relay includes a damping device for smooth operation and is equipped with a self-cleaning primary orifice and a by-pass arrangement which permits changing to manual control by turning one screw. *American Meter Co.*

IT'S NEW CHECK IT

(3) NEW STAINLESS-STEEL GATE VALVE. This new series is available in sizes ranging from ½ to 6 in. with flanged ends in sizes ½ to 2 in. with screwed ends. Bodies and bonnets are regularly cast of 18-8 SMO stainless steel or of alloy 20 stainless steel. All other important valve parts are of type 303 stainless steel with the exception of the nickel-alloy yoke sleeve. Other body and bonnet trim material to meet your specifications can be supplied when so ordered. Also available is a new 600-lb. series carbon steel gate valve in sizes from ½ to 2 in. with flanged, screwed, or socket welded ends. These carbon steel valves can be furnished of the same materials as the 150-lb. stainless steel valve described above. *Pacific Valves, Inc.*



IT'S NEW CHECK IT

(4) NEW MICRO-SURVEYING ALTIMETER graduated in intervals of 1 ft. over a range of 6,000 ft., this instrument is accurate to 1 ft. and sensitive to altitude changes in inches. Surveys can be run with this easily portable instrument, weighs only 4½ lb., in one-tenth the time consumed in ordinary surveys with accuracy and dependability. Included with each instrument are a magnifier, thermometer, and full operational procedures. *American Paulin System.*

IT'S NEW CHECK IT

The Oil and Gas Equipment Digest presents a review of what is new in equipment and trade literature . . . makes it possible for readers to obtain full information on every subject by use of convenient "Check It—Mail It" service card. This periodic feature of The Oil and Gas Journal will include all that is new in equipment . . . at a time when new products are being introduced, and existing products improved.

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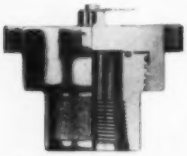
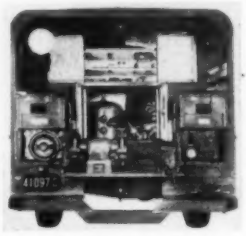
(5) TWO-PIECE BLANKING PLUG UNION. Utilizing an oil-resistant O-Ring seal, this union consists of only two parts, a threaded sub end containing the O-Ring for attaching to the line, and the blanking plug, which may be furnished blank or tapped for drain cock. It is designed for use on pipe-line scraper traps, jumper assemblies, and manifolds. The O-Ring seal will hold against all pressures or vacuum when the mating parts are snapped up hand tight. This results in a union that can be made up or broken out in a minimum of time. Sizes from 1 through 16 in. are available, for working pressures as specified. In sizes up to 8 in., the blanking plug is connected to the sub end or line by a steel chain. Sizes above 8 in. may be furnished with chains, or with hinged steel yokes as specified. *Yale Machine Works.*



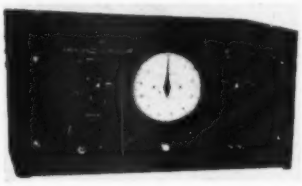
IT'S NEW CHECK IT

(6) MOBILE FIELD SERVICE-TYPE UTILITY UNIT includes all of the equipment necessary for the servicing of construction, oil-field, or other machinery operating over large areas and distant from service centers. It is mounted on a four-wheel-drive truck. Main equipment items include a 300-amp. welder and an 8-kw., a-c generator. These are driven direct from the truck engine through a heavy-duty power takeoff. Utilization of this takeoff eliminates the necessity for separate engines for each piece of equipment. The resulting space savings provide room for other needed equipment. Power for operation of the unit's high-pressure lubrication equipment is provided by a compressor operating at 150-psi. pressure. *Davey Compressor Co.*



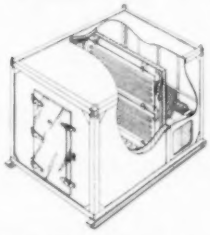
IT'S NEW CHECK IT

(7) HIGH SPEED CHRONOSCOPE, an electronic stop watch for the measurement of time from 10 microseconds to 1 second. The clock face is calibrated directly in units of time. Operation of the instrument is entirely automatic. It is only necessary to present to its terminals the time interval to be measured, and to observe the resultant reading on the dial. Time intervals may be presented mechanically, either by short-circuiting the Chronoscope input terminals or by open-circuiting these terminals, or electrically by causing any voltage from 6 to 120 volts to appear across input terminals. Adapters can be supplied for measurements which are delimited by the two described means. *American Chronoscope Corp.*



IT'S NEW CHECK IT

(8) JUNIOR SERIES CARGO REEFERS are availabe in 150 and 200-cu. ft. sizes. They are completely welded steel, refrigerated enclosures equipped with self-contained gasoline and electric-driven refrigerating units. Exterior is of welded, 14-gage steel with protective coating of two applications of marine-type gray enamel over a primer coat of zinc chromate. Interior is of 18-gage galvanized, welded steel. Insulation consists of 6 in. of Fiberglas on sides and bottom, and 8 in. of Fiberglas on top. Portability is achieved through use of heavy I-beam skids prepared for lifting and towing through use of lifting rings and towing eyes. *Refrigeration Engineering Corp.*

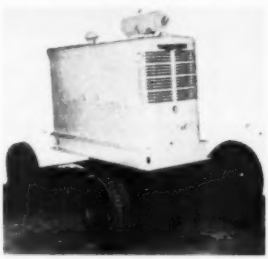


IT'S NEW CHECK IT

(9) HAYS-PENN MAGNA-CLUTCH. This new type of flow meter features a magnetic clutch to transmit the movement of the float. More power with less friction is claimed for the new meter due to its exceptionally large float and long float travel. The movement of the float is transmitted through a pressure-tight manometer by means of the magnetic clutch. This construction eliminates stuffing-box friction, leakage, and maintenance, and makes for sustained accuracy. *Hays Corp.*

IT'S NEW CHECK IT

(10) TRAILER-MOUNTED ELECTRIC GENERATOR SETS in capacities ranging from 10 to 85 kw. These units, specially designed for on-the-job operation, can be easily moved from location to location, making them ideal for maintenance, oil fields, and construction camps. Available in both diesel and gasoline, 50 and 60 cycles, and in all standard voltages, these generator sets consist of an engine driving a generator, with an instrument panel containing all starting controls and switchgear, spring mounted on a sturdy, pneumatic-tired four-wheel trailer. The trailer is equipped with a steel angle drawbar for attaching truck or tractor. *International Diesel Electric Co., Inc.*



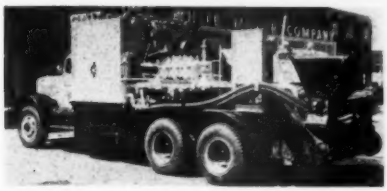
IT'S NEW CHECK IT

(11) TANCO is a quebracho compound for drilling muds. This product is based upon the discovery that certain complex salts of an organic acid and tannic acid exhibit synergic action when combined in the proper

proportions under controlled conditions of temperature and pH. The combination of the two materials is described as synergic because the Tanco is more effective in reducing the viscosity of a drilling mud than either one of the components used alone. It has excellent noncaking properties, it is more readily soluble than quebracho, the ingredients are 100 per cent active on the mud, and the mud responds to prolonged treatment where in many cases quebracho has become ineffective. *Milwhite Co.*

IT'S NEW CHECK IT

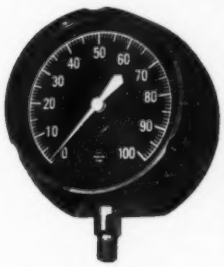
(12) TYPE 102DT CEMENTING UNIT will pump substantial volumes of fluid at working pressures up to 7,000



psi. Developed as an intermediate type between the standard PD cementing unit and the PL high-pressure unit. Unit is mounted on a White Super Power model WB 2864 truck chassis with dual drive and superpower 184-hp. engine, capable of operating in as many as 15 forward speeds and 3 reverse speeds. Unit consists of a triplex pump, and mud and water tank of 200 cu. ft. capacity. Special I.C.I. mixing equipment with water proportioner, mounted as an integral part of unit, assures an even precalibrated slurry to meet the most exacting oil-well cementing standards. *International Cementers, Inc.*

IT'S NEW CHECK IT

(13) NEW 3½-IN. DIAL GAGE. This smaller-size gage is made with a steel bourdon tube, particularly adaptable for ammonia ice machines, pumps, compressors, and hydraulic presses up to 10,000 psi. It has the same features as the larger gages. These are: the Helicoid movement which means there are no teeth to wear out, stainless-steel bearings, Korex steel bourdon tubes, fused joints, and the external pointer adjuster. Besides being available in the new size of 3½-in., the gage is also furnished in 4½, 6 and 8½-in. dial sizes. *Helicoid Gage Division, American Chain & Cable Co., Inc.*

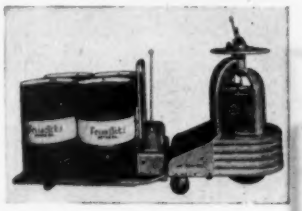


IT'S NEW CHECK IT

(14) AUTOMATIC CONTINUOUS PACKET BLOWDOWN removes impurities from the boiler, and saves the heat by transferring it from the blowdown water to the incoming feedwater. This unusually compact and inexpensive unit is particularly designed for small plants of under 500 b.hp. It permits an accurate control of concentration such as is usually obtainable in large plants. A simple automatic control is set to establish the amount of continuous blowdown in proportion to the quantity of makeup water and its impurities. This control then regulates the amount of blowdown for variations in the amount of makeup water added to the boiler system. The heat from the blowdown water is returned to the boiler by means of the heat exchanger. *Henszey Co.*

IT'S NEW CHECK IT

(15) LOAD DISPATCHER is a gas-powered material-handling truck of 3,000-lb. capacity for horizontal transportation. Outstanding feature is the simplicity of its design and the principles on which it handles. It is extremely maneuverable in narrow aisles, small spaces, and dead ends, and is easy to handle and can be operated by unskilled labor. Has no transmission, no clutch, no electrical batteries, no radiator, and hence there is no need for electrical charging devices or antifreezes. Drive wheel under control of the steering wheel can be turned the full 360°. The truck, therefore, travels in the direction it is pointed, forward, backward, or at any angle between. *Schwitzer-Cummins Co.*



IT'S NEW CHECK IT

(16) GRIP-SLIDE TOOLS are simple and safe to handle. They enable any man to cut true finished thread easily, safely, accurately, and fast, in one pass, using standard dies and taps, American, British, or metric. Grip-slide tools are ideal for hand-tapping and thread cutlines on drill presses. Actually Grip-Slide tools are modern holders for dies and taps. They increase output and decrease costs on special and short-run thread cutting as automatic tools increase output and decrease costs on long or production runs. *Threadmiller Corp.*

IT'S NEW CHECK IT

(17) TURBINE-TYPE PUMP with impeller fastened firmly to an enlarged shaft by a lock nut and a woodruff key eliminating metal-to-metal contact, features sealed-in-grease ball bearings to insure a prolonged pump life. Bearing end play is eliminated by use of a preloading spring under the outer adjusting nut. This preloading spring is adjusted to exact tension recommended by ball-bearing manufacturer for maximum bearing life. Elimination of bearing end play insures absolute location of shaft and impellers. Features include the development of high pressures in single-stage construction and heads and impellers that are renewable when the capacity of the pump is to be changed. *Roy E. Roth Co.*

TRADE LITERATURE

(18) SEAMLESS STEEL PIPE COUPLINGS is a compilation of engineering data sheets and illustrations covering a complete line of pipe couplings. *Harrisburg Steel Corp.*

(19) ABSOLUTE PRESSURE RECORDER. The bulletin describes the instrument and gives data on the new principle of operation employed, which makes it possible accurately to record and automatically control absolute pressure within a scale range as low as zero to 20 mm. of mercury absolute. *Bristol Co.*

(20) LIQUID-LEVEL CONTROLLERS. Both direct-connected and air-actuated controllers are illustrated and described in this 32-page catalog, with details of the special construction features and typical applications. Schematic drawings, diagrams, and photographs are included, with capacity charts, flow characteristics, pressure-temperature rating charts, and dimensions. *Minneapolis-Honeywell Regulator Co.*

(21) VELOCITY-POWER DRIVER. How steel studs can be driven instantaneously into steel, masonry, or concrete with the Velocity-Power Driver is told in this new four-page bulletin. *Mine Safety Appliance Co.*

(22) BOOK OF PIPE PROTECTION is a 22-page, illustrated book giving complete information on pipe coating and wrapping. In addition to other useful information it explains plant storage; why preheating; cleaning, coating, and wrapping applications; inspection methods; delivery scheduling; load unit shipping, and field handling. *Hill, Hubbell Co.*

(23) OIL-FIELD EQUIPMENT includes specification data, illustrations, and applications of ZC engines, power pumps, centrifugal pumps, turbine-type pumps, rotary pumps, electric motors, Z engines, water systems, light plants, and diesel engines. *Fairbanks, Morse & Co.*

(24) FURNACE WALL AND ARCH CONSTRUCTION is a 28-page book devoted to construction principles, design, and materials used in the construction of furnace walls and arches. It includes heat loss graphs on each design. *Laclede-Christy Clay Products Co.*

(25) BEECH LOG. The July-August issue of this magazine features a very interesting article on the use of air transportation by a major oil company. The article emphasizes the time savings effected by executive personnel. *Beech Aircraft Corp.*

(26) GENERAL AMERICAN describes and illustrates dryers, filters, turbomixers, evaporators, floating roofs, vapor seals, gas holders, and other fabricated processing and storage equipment. *General American Transportation Corp.*

(27) VARIABLE SPEED A. C. DRIVE. A new 12-page bulletin describing an alternating-current motor having infinitely adjustable speed, and variable speed output with a constant torque characteristic. *Louis Allis Co.*

(28) COMBINATION HANDBOOK AND CATALOG. This illustrated booklet lists All-State rods and fluxes, including several new items. It contains tables of characteristics, and full application information. *All-State Welding Alloys Co., Inc.*

(29) V-BELT DRIVE. This 96-page book contains stock drive tables, engineering data, and examples to help you select a sure-grip V-belt drive. It also has sections devoted to special drives, sheaves, V-belts, and general engineering information. *T. B. Wood's Sons Co.*

(30) PLATE FABRICATION AND HEAT EXCHANGERS. This attractive 16-page bulletin contains lists of general facilities, manufacturing equipment, welding procedure qualifications, and standard heat-exchanger construction details. *Downingtown Iron Works, Inc.*

(31) CONO CONTROLS. This illustrated six-page bulletin was designed to assist busy engineers and technicians to locate uncommon equipment related to industrial automatic control. It contains specifications and other important engineering data on regulator equipment. *Conoflow Corp.*

(32) ALLOY STEEL CHAIN, a new 12-page bulletin, contains complete specifications on sizes ¼ to 1¾-in.-diameter inclusive; working-load limits, definitions and cautions, recommended use and details of chain service for alloy-steel chains, sling chains, and attachments. *S. G. Taylor Chain Co.*

(33) DEEP WELL TURBINE PUMPS. A new 12-page illustrated bulletin describes the Deepwell pump. For Deepwell pump selections—widely varying well diameters, capacities, and heads are covered by three distinct typs of bowl assemblies. Bowl assembly sizes are for installation in wells from 6 to 24 in. or larger. Byron *Jackson Co.*

(34) DRILL-MORE FLOATING-SPEED REGULATOR. An improved regulator for their portable compressors is fully described in a new folder. According to the manufacturer, this new regulator is much simpler in operation and easier to adjust than the original Multi-Speed regulator. *Ingersoll-Rand Co.*

(35) ROTARY MACHINE. Complete illustrated descriptions of two light-weight Ideal rotary machines are available in a new eight-page bulletin. They are the FE-12½-36 and FE-12½-44, which were developed for shallow or slim-hole drilling. *National Supply Co.*

(36) TUBE EXPANDERS. This new six-page folder gives data on expanders for condensers, heat exchangers, and general small tube rolling, and explains an improved, adjustable ball-bearing thrust collar. *Thomas C. Wilson, Inc.*

(37) NAMES OF VALVE PARTS. Diagrammatic sketches of gate, globe, check, and lever-operated valves are presented along with a uniform material and parts identification code. *Cooper Alloy Foundry Co.*

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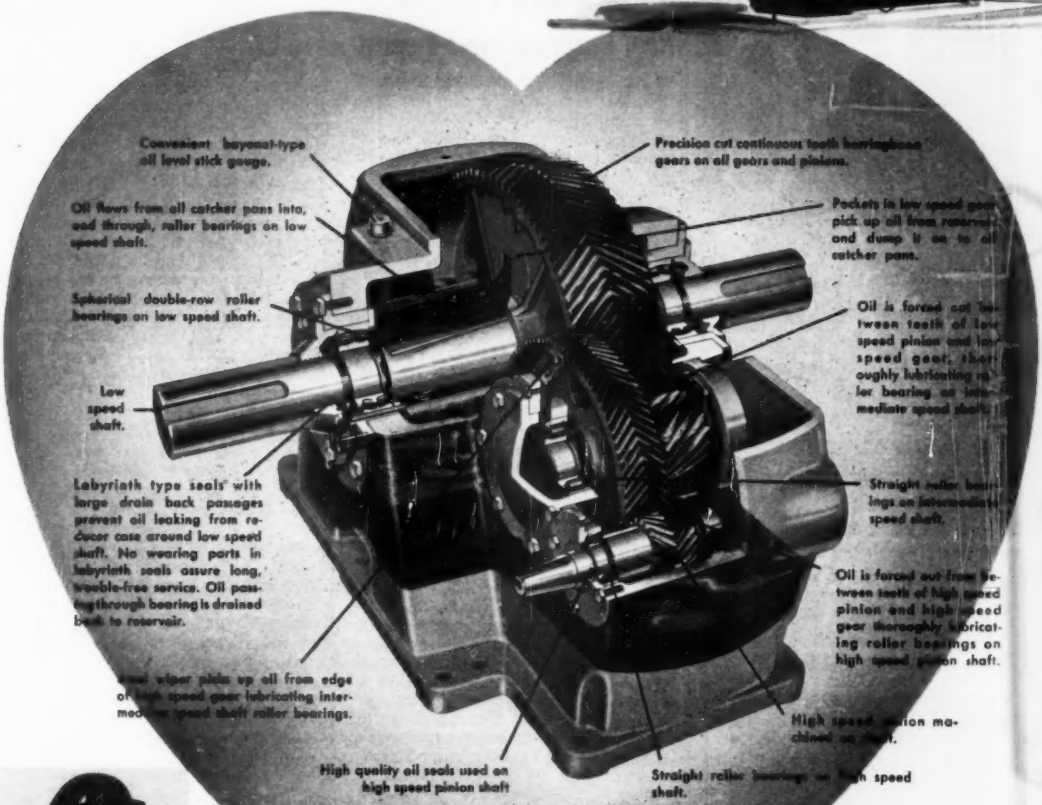
The Heart of Your Pumping Unit...

EMSCO PUMPING UNIT GEAR REDUCERS


Convenient bayonet-type oil level stick gauge.
Oil flows from oil catcher pans into, and through, roller bearings on low speed shaft.
Spherical double-row roller bearings on low speed shaft.
Low speed shaft.
Labyrinth type seals with large drain back passages prevent oil leaking from reducer case around low speed shaft. No wearing parts in labyrinth seals assure long, trouble-free service. Oil passing through bearing is drained back to reservoir.
Gear wiper picks up oil from edge of high speed gear lubricating intermediate speed shaft roller bearings.
High quality oil seals used on high speed pinion shaft
Straight roller bearings on high speed shaft.
High speed pinion machined on shaft.
Oil is forced out from between teeth of high speed pinion and high speed gear thoroughly lubricating roller bearings on high speed pinion shaft.
Straight roller bearings on intermediate speed shaft.
Oil is forced out between teeth of low speed pinion and low speed gear, thoroughly lubricating roller bearing on intermediate speed shaft.
Pockets in low speed gear pick up oil from reservoir and dump it on to oil catcher pans.
Precision cut continuous tooth herringbone gears on all gears and pinions.

The heart of any pumping unit is its gear reducer. The gear reducer must provide the continuous, 'round-the-clock power transmission necessary for profitable pumping. Look inside any Emsco Pumping Unit Gear Reducer and you'll see the reason for their unmatched efficiency and dependability. Bearings, gears, oil seals, shafts and oil passages are all engineered to provide long, trouble-free service. And the gear reducer unit typifies the research, engineering and skilled workmanship that goes into every component part of an Emsco pumping unit. Emsco Pumping Units are available in both standard and floor-clearing models for shallow, medium or deep pumping with a range of speeds and strokes to meet all requirements. *You can't buy a better pumping unit than an Emsco!*

Adv. 943-49

Emsco single reduction gear reducer. Emsco single and double reduction gear reducers conform strictly to A.P.I. specifications.

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PIPE LINES

Northeastern Files for New England Line Permit

THE newly formed Northeastern Gas Transmission Co. has filed an application with Federal Power Commission seeking authority to construct and operate a 511-mile natural-gas transmission system in New England, Alexander Macomber, chairman of the board, announced last week.

Northeastern will serve as a wholesaler and transporter in the six New England states and its principal offices will be in Boston.

The company has made arrangements to obtain a supply of natural-gas from Tennessee Gas Transmission Co., now extending its lines toward New England, and Transcontinental Gas Pipe Line Corp., now constructing a transmission system to New York City. Gas is supplied these lines from Louisiana and Texas fields.

Macomber said that part of this gas supply may be available by late 1950, with the remainder scheduled by late 1951.

Agreement Made

Each of the cross-country natural-gas pipe-line systems has entered into an agreement with Northeastern to extend its system to connect with Northeastern in New England. Tennessee Gas Transmission Co. has applied to the FPC for authority to extend from its presently authorized terminus near Buffalo, into Massachusetts *(The Oil and Gas Journal, August 11, 1949, page 114)* to connect with Northeastern at points in Massachusetts. Transcontinental plans to extend its system from New York City to connect with Northeastern at the Connecticut-New York state line near Greenwich. This will give the New England states a double and interconnected source of supply, it was pointed out, thus assuring dependability of service.

Northeastern will lay its pipe-line system so as to make natural gas available to the most populous New England cities. It also will lay laterals to city gates where economically feasible, it was stated.

The application filed with the FPC proposed a pipe-line system in New England consisting of 511 miles of main-transmission and lateral pipe line ranging up to 20-in. in diameter. Estimated cost of the facilities was placed in excess of $17,000,000.

Northeastern's contracts, both for the purchase of gas supply and for sale to New England distributing companies, will be on a 20-year basis.

Northeastern will sell natural-gas to local gas companies in New England at a uniform wholesale rate, which will consist of a monthly demand charge of $3.75 per 1,000 cu. ft. of gas plus a commodity charge of 25 cents per 1,000 cu. ft. of gas used.

Macomber said that for Tennessee Gas Transmission Co. to assure successful arrangements for the sale and delivery of natural gas, it will provide the initial capital required by Northeastern during its period of organization and FPC hearings with the expectation that New England capital will be given an opportunity to participate in providing capital required for the sound financing of the project.

Directors Elected

Election of five of the seven directors authorized was also announced. In addition to Macomber, they are: Daniel H. Morrissey, attorney of Providence, R. I.; Charles H. Tenney, II, Boston utility executive; R. K. Hanger, a Tennessee Gas director; and Gardiner Symonds, who is a Tennessee Gas director as well as Tennessee's president.

Creation of the Northeastern Gas Transmission Co., with its arrangements with Tennessee Gas and Continental for two sources of supply, makes it possible to have natural gas in New England by late 1950, at least a year earlier than had previously been anticipated, it was pointed out.

Northeastern's agreements call for Transcontinental to provide Northeastern up to 100,000,000 cu. ft. of gas daily and for Tennessee Gas to provide all of Northeastern's remaining requirements, which is estimated will be initially 120,000,000 cu. ft. of gas daily, with the obligation of Tennessee to supply additional requirements as the market demand grows. Thus Northeastern will be assured of an initial supply of approximately 220,000,000 cu. ft. daily.

United Seeking to Increase Louisiana Line's Capacity

United Gas Pipe Line Co., Shreveport, has asked Federal Power Commission to authorize construction of 105.6 miles of loop line in Louisiana designed to increase the company's deliveries of natural gas to Mississip-

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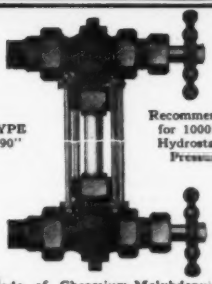

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pi River Fuel Corp. to approximately 195,000,000 cu. ft. daily.

The proposed 20-in. loop line would parallel United's existing 24-in. Carthage (Tex.)-Sterling (La.) pipe line for part of its length in Louisiana only and would extend from DeSoto County, near the Texas - Louisiana state line east to a point in Ouachita County, near the city of Monroe, La.

The company has also applied to FPC for authorization to build 224 miles of pipe line designed to carry natural gas from several producing fields in southeastern Louisiana for delivery to Atlantic Gulf Gas Co. at the western terminus of that company's proposed Louisiana-South Carolina-Florida pipe-line project.

United's proposed project, to be built at an estimated cost of $25,060,000, would deliver the requirements of the proposed Atlantic Gulf line, estimated at 384,251,000 cu. ft. of natural gas per day for the fifth year of operation.

New 40-Mile Crude Line in Michigan Now in Operation

A new 40-mile, 6-in. crude-oil pipe line was placed in operation by Simrall division of Roosevelt Oil & Refining Corp. in Michigan recently. The new line, which connects Pentwater field of Oceana County with Simrall's main trunk from Kimball Lake field to the Reed City station, provides a pipe-line outlet from Pentwater to all major Michigan and Ohio refining centers.

Approximately 3,800 bbl. of crude daily was being run through the line the latter part of August. The 40-mile spur was constructed by Somerville Construction Co. Initial work was begun July 20.

Tom Green County, Texas Gets Pipe-Line Outlet

HOUSTON.—Republic Pipe Line Co. of Corpus Christi has construction under way on a 40-mile, 4-in. line from Susan Peak field in Tom Green County, West Texas, to Shell Pipe Line Corp.'s station 6 miles west of El Dorado.

Cost of the line is reported to be about $450,000. This will be the first pipe line outlet for Tom Green County. Capacity of the line is 2,500 bbl. daily with one pump and 3,800 bbl. daily with two pump units.

Potomac Gas Co. Authorized To Purchase 12-In. Line

Federal Power Commission Presiding Examiner Ewing G. Simpson has issued an initial decision, subject to review by the commission, authorizing Potomac Gas Co. to purchase 13,-

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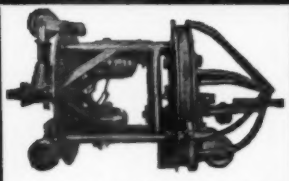

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000 ft. of 12-in. natural-gas pipe line in Arlington County, Virginia, from Rosslyn Gas Co. Both companies are subsidiaries of Washington Gas Light Co.

The section of line involved in the purchase has a capacity of more than 15,000,000 cu. ft. of natural gas per day and extends from the terminus of the Potomac Gas Co. line at Lee Boulevard and Fillmore Street in Arlington County to a connection with Washington Gas Light's system on the Virginia side of Key Bridge. Potomac plans to use the line for the transportation of gas for the account of Washington Gas Light Co. The line will be used to transport gas to the Washington company's system in the district and from the Washington company's district system into Virginia.

Central Hudson Proposes 40-Mile Line in New York

Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y., has asked Federal Power Commission to authorize the construction of a 40-mile pipe line which would carry natural gas for distribution in Dutchess, Orange, and Ulster counties, New York. Central Hudson now supplies this area with manufactured gas.

The proposed line would connect at Tuxedo, N. Y., with the line now being constructed by Home Gas Co., and would extend northerly to Central Hudson's gas plant in Poughkeepsie. Estimated over-all cost of the line is $1,700,000.

The company said that use of gas by its customers is now severely limited by the high rates for manufactured gas, and that it anticipates lower rates with the substitution of natural gas. Estimates of the company's peak-day natural-gas requirements range from 1,800,000 cu. ft. in 1951 to 2,000,000 cu. ft. in 1953.

Another Firm Seeking to Build Line in Virginia

Eastern Natural Gas Co., of Richmond, Va., has filed an application with Federal Power Commission asking authorization to construct a 165-mile natural-gas transmission line extending from the vicinity of Stanardsville, Va., in a southeasterly direction to the Norfolk, Va., area. Estimated over-all cost of the project is $5,940,000.

Three other applications which propose, among other things, to transport and sell natural gas for resale in Richmond and Norfolk, are now pending before the commission. FPC recently consolidated proceedings on these applications, filed by Commonwealth Natural Gas Corp., Virginia Natural Gas Co., and Piedmont Natural Gas Corp. and fixed September 14 as the date for hearing.

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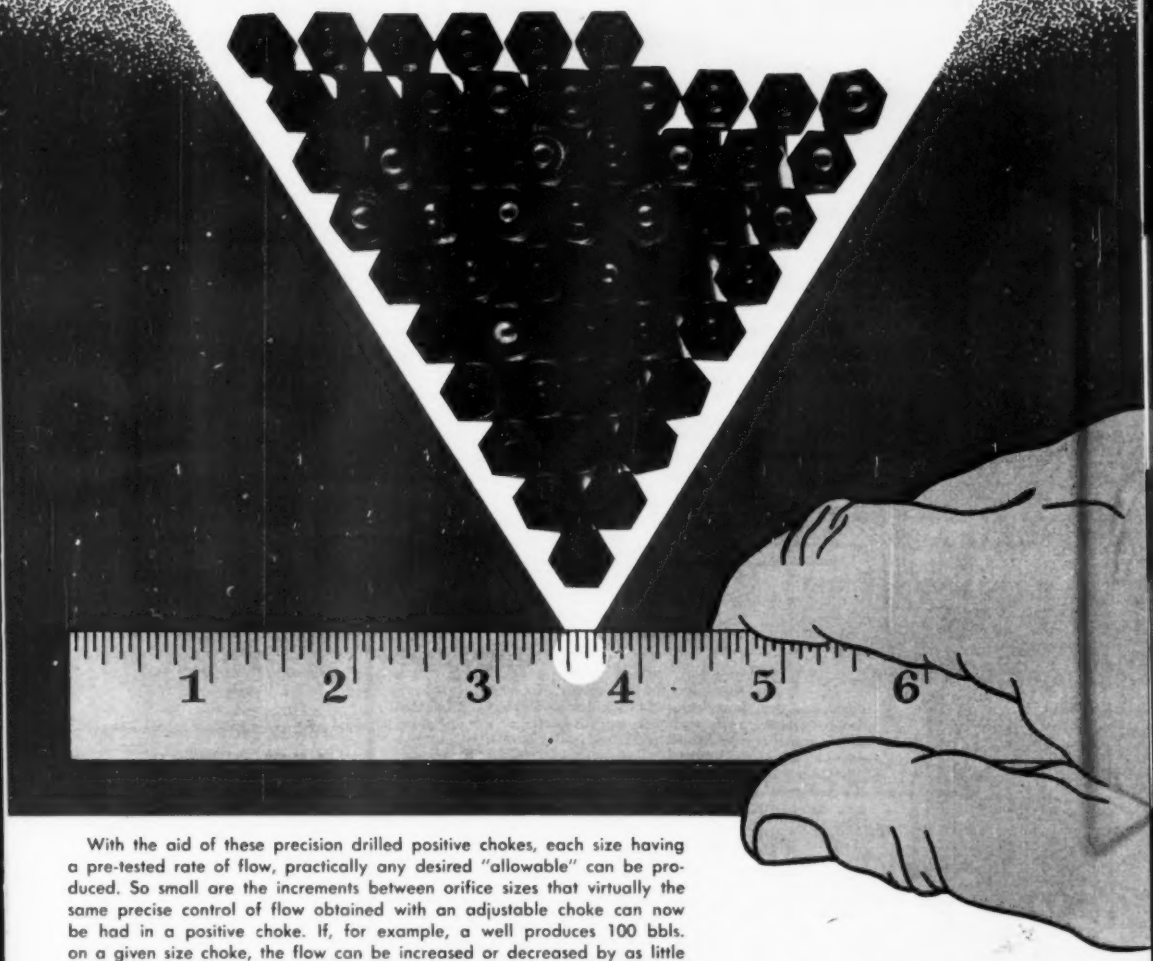

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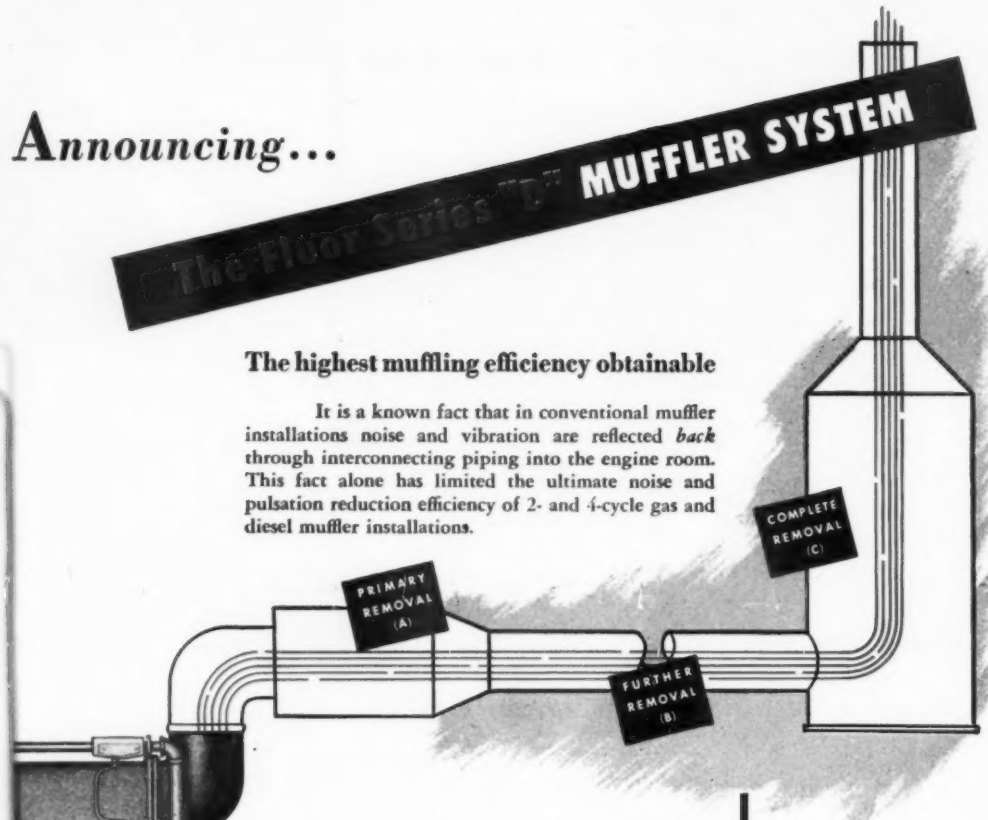

To overcome this limiting factor, Fluor Engineers have developed the Fluor Series "D" Muffler System—a scientifically designed muffler *system* wherein work is started on exhaust gases in the immediate proximity of the engine—a muffler *system* that provides all of the advantages of the Fluor Model "T" Muffler *plus* added design features that solve field muffling problems conventional mufflers do not even attempt to solve—and at a cost competitive with conventional single-element mufflers.

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In addition to providing the highest muffling efficiency obtainable, the Fluor Series "D" Muffler System needs no redesign or alteration of existing plans for installation in new or old plants. It takes no more space than conventional mufflers—in 95% of cases space requirements are *less* than conventional type mufflers—in 5%, the same as conventional type mufflers.

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REFINING

Continental Expansion Is Nearing Completion

EXPANDED refinery facilities at Continental Oil Co.'s Ponca City, Okla., plant will go on stream the latter part of September, L. F. McCollum, president, announced last week. The expansion program cost an estimated $8,000,000.

Started a year ago as part of the company's long-range continuous expansion throughout its organization, the refinery installations at Ponca City boost the crude-oil processing capacity of the refinery from 33,000 bbl. to 52,500 bbl. daily.

The project includes a new 30,000-bbl. daily capacity crude-topping unit, which includes a furnace, fractionating system, heat exchangers, condensers, a control room, pumping equipment, and other units. New construction also includes a water-cooling system, a new facility for treating gasoline, a crude-desalter unit, and complete refinery pipe-line and tankage rearrangement.

In addition the facilities include the complete modernization of the firm's Thermofor catalytic cracking unit, the first aviation-gasoline plant completed in Oklahoma, which Continental leased from the Government during the war and later purchased.

McCollum said that the company is now giving thought to additional expansion of its development and research program.

Third Plant in Houston Area Shut Down by Strike

HOUSTON.—A third plant in this area was struck last week by the C.I.O. Oil Workers' International Union.

The Manchester plant of Consolidated Chemical Industries, Inc., which produces sulfuric acid, was the latest to be closed down. Previously struck plants were the 26,000-bbl. refinery of Crown Central Petroleum Corp. and Mathieson Chemical Corp.'s plant.

Crown Central's refinery has been closed since July 7. The National Labor Relations Board this week dismissed charges of unfair labor practices brought against Crown Central by five employes. Charges brought by the local union against the company, and vice versa, are still pending before the NLRB.

Union representatives said that the Manchester strike began after the company refused to arbitrate a wage dispute. In a letter to the union, Plant Superintendent C. M. Hickey said, "The plant is still operating and will continue to operate. We intend to hire such new employes as may be necessary to operate the plant at full capacity, and replacement of absent employes may be necessary." Hickey said there were 160 union employes in the plant.

Expansion at Esso's Bayway Refinery Nearly Completed

Initial operation of a 41,000-bbl.-per-day fluid catalytic cracking unit marks the virtual completion of a 2-year expansion program at Esso Standard Oil Co.'s Bayway refinery, Linden, N. J.

The giant unit, together with light ends recovery facilities, is now in the preliminary startup period and is expected to assume smooth operation in about 1 month.

Oil was first charged to the cracking unit on August 23. The major construction program also included installation of a 49,000-bbl.-per-day vacuum pipe still, placed on stream earlier this summer.

ECA Approves New Refining Facilities for France

Two recovery projects to rehabilitate and modernize refinery facilities in France which involves three separate plants, have been approved by Economic Cooperation Administration.

Total cost of the projects in dollars is $20,435,000, of which $3,900,000 represents dollar expenditures to be financed with ECA funds, the balance being in francs.

One project involves rehabilitation and expansion of the Donges refinery located near St. Nazaire, and owned by Raffineries Francaise de Petrole de l'Atlantique. This plant was heavily damaged during the war.

The other project involves installation of lubricating-oil equipment at the Gonfreville refinery in North France, and alterations on a cracking unit at the La Mede refinery near Marseille. Both plants are owned by Compagnie Francaise de Raffinage.

The major jobs at the Donges refinery will cost $9,435,000, of which $750,000 is to be financed by ECA. It is proposed to increase the plant's

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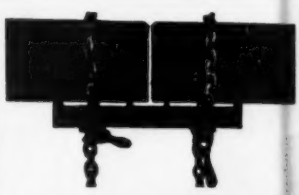

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capacity and install facilities to increase production of lubricating oils. Crude from the Middle East will be available for the refinery's operation.

Cost of the Compagnie Francaise de Raffinage project amounts to $11,000,000, of which $3,150,000 will be financed by ECA. It is proposed to install facilities at Gonfreville to produce lubricating oils and wax.

Price of Ethyl Antiknock Compound Is Increased

Ethyl Corp. has announced increases in the price of its antiknock compounds of approximately 3.5 per cent. The new prices, to become effective October 1, are the same as those which prevailed before the company made two price reductions in May.

E. L. Shea, president, stated that since the price reductions in May the company's costs have increased, particularly in the price of metallic lead.

Gulf Signs Contract With Texas Town to Buy Water

Gulf Oil Corp. has signed a 30-year contract with the city of Sweetwater, Tex., to supply its refinery which makes the oil firm an indirect partner with the town in building of Oak Creek Lake.

Gulf will begin paying a stand-by charge of $27,000 per year to the city when $2,500,000 in lake-project bonds are sold. This payment will continue for 30 years, and when Gulf's refinery expansion is completed the company will start paying the city $125,000 per year.

Gulf now uses about 435,000 gal. of water daily in its Sweetwater plant.

Socony-Vacuum Completes New Hudson River Wharf

The first tanker arrival at the new wharf at Socony-Vacuum Oil Co., Inc.'s Hudson River terminal at Albany, N. Y., is scheduled this week, when the Siwanoy, from Beaumont, Tex., puts in with two grades of gasoline and two grades of diesel fuel.

The new wharf replaces two breasting barges used previously at the terminal. It is 50 ft. long and 25 ft. wide, supported by steel pilings and surfaced with concrete.

Roosevelt Plans Gas Line To Supply Its Refinery

Roosevelt Oil & Refining Corp., Mt. Pleasant, Mich., announced plans to construct a 7-mile, 6-in. gas pipe line from the Isabella field, Isabella County, to the company's Mt. Pleasant refinery. Field surveys indicate that Roosevelt has approximately 14,000,000 cu. ft. open-flow gas reserve for use to fuel the oil refinery when the line is completed.

This reserve is based on tests of both dry gas from the Michigan Stray sand and Dundee wet casing-head gas which will be blended with the field and run to market.

Roosevelt has one commercial Stray sand well in the field, spudded another this week, and announced intentions to drill four others immediately.

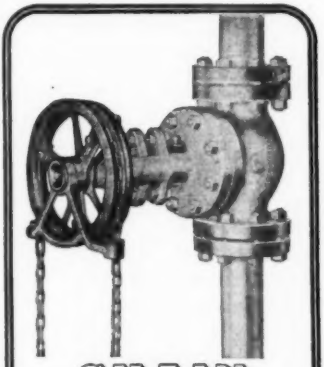
Maximum daily gas requirements at the refinery were placed at 3,000,000 cu. ft. Construction contract was scheduled to be let this week.

June Refinery Statistics Indicate Lower Crude Runs

Crude-oil runs to stills of 5,162,000 bbl. daily during June showed a decrease of 33,000 bbl. from May, and a drop of 470,000 bbl. from runs during June a year ago, U. S. Bureau of Mines figures indicated.

Daily average imports of foreign crude were 400,000 bbl., 9,000 bbl. less than during May but 75,000 bbl. daily higher than 1948 figures.

Crude-oil stocks at refineries decreased 2,759,000 bbl. in June, according to the bureau's figures.



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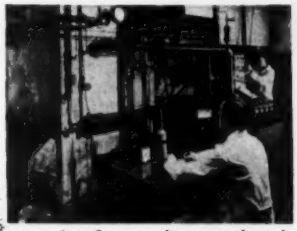
When you specify Aerofin finned heat-transfer surface, you specify high efficiency, long life and easy maintenance. As pioneer in the field, Aerofin has developed unequaled know-how and production facilities to apply to your particular heat-transfer application. Continual research accounts for the accuracy of Aerofin's published ratings. You can use them with full confidence.



Aerofin controls every phase in the production of its finned heat-transfer coils and units. This control is maintained by rigid specifications and inspection, and all assembly is done in the Aerofin plant.

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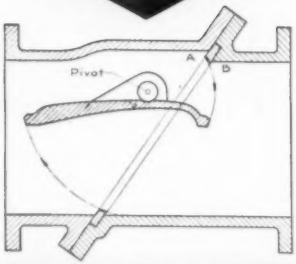

Cross-section of the Chapman Tilting Disc Check Valve illustrating the way that the balanced disc is supported on the pivot, with arrows showing the travel of the disc. A feature of the design is that the disc seat lifts away from the body seat when opening, and drops into contact when closing, with no sliding or wearing of the seats.

That's right! Maintenance costs *are lower* with Chapman Check Valves . . lower because the balanced disc works *with the stream.* There's no slamming to cause destructive pipe line stresses and increase maintenance costs. Nor is there any rubbing on seats . . . the disc closes quickly and quietly with no sliding or wearing action.

Yet that's only half the story. Head losses are actually 65% to 80% lower than for conventional type check valves. And, when used on pump discharge lines, substantial power savings are possible.

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NATURAL GAS

First Natural Gas in New York City Is Now in Use

New York City's first natural gas is now in use on Staten Island, in the borough of Richmond. On August 22 Mayor William O'Dwyer turned a valve in the New York & Richmond Gas Co. plant which permitted the fuel to enter the company's distribution system.

The gas is being piped through a feeder line to Staten Island from the terminus of Texas Eastern Transmission Corp.'s Big Inch system lines at Linden, N. J. New York & Richmond will receive up to 4,000,000 cu. ft. daily.

The company formerly distributed manufactured gas, and it absorbed the cost of revamping equipment for natural-gas use. Company officials estimated that customers will save $200,000 a year due to the change-over.

Approximately 38,000 customers are now using the gas in Richmond borough.

However, this apparently is only the first step in getting more natural gas in the metropolitan area. The New York City Public Service Commission has authorized Consolidated Edison Co. to construct 3½ miles of gas main in Queens borough at a cost of $1,100,000 to carry natural gas *(The Oil and Gas Journal, July 14, page 118)*. Several other utility companies are cooperating to make natural gas available in both Brooklyn and Queens boroughs, and in the area on Long Island outside the city limits served by Long Island Lighting System.

Consolidated Edison has contract with Transcontinental Gas Pipe Line Corp. for a supply of gas when the latter's 1,800-mile transmission system, now under construction, is completed.

Manufacturers Seeks Permit For Line in Pennsylvania

Manufacturers Light & Heat Co., Pittsburgh, has asked Federal Power Commission to authorize construction of pipe-line facilities which would be used for the transportation and sale of natural gas to distribution companies serving in and adjacent to Harrisburg, Allentown, Bethlehem, Reading, and Lancaster, Pa.

Manufacturers, subsidiary of Columbia Gas System, is proposing to construct and install connections with the pipe-line systems of Allentown-Bethlehem Gas Co., Harrisburg Gas Co., Consumers Gas Co. and Lancaster County Gas Co. In addition to the connections, the proposed project includes construction of metering and regulating stations, and 1.5 miles of 10-in. line between Manufacturers' system and Texas Eastern Transmission Corp.'s Big Inch line. Estimated cost of the facilities is $232,000.

Application says natural gas would be supplied from Manufactures' system and, subject to regulatory approval, from Texas Eastern, which previously was ordered by the commission to deliver up to 7,500,000 cu. ft. daily to the distribution companies in Harrisburg, Allentown, Bethlehem, and Reading.

Mayor William O'Dwyer of New York City sets the first jet aflame during ceremonies at Staten Island, August 22, marking the opening of mains for the first natural gas ever to come into the New York City area. The fuel is being piped from Texas and Louisiana fields through the Big Inch system of Texas Eastern Transmission Corp. and comes to the island from that company's pipe-line terminus in Linden, N. J., via feeder line. New York & Richmond Gas Co. will receive up to 4,000,000 cu. ft. daily

Natural Gasoline

Operations Under Way at Humble's Pickton Plant

HOUSTON.—Humble Oil & Refining Co. has started operations at its new combination pressure-maintenance and gasoline plant 1½ miles southwest of Pickton in Hopkins County, East Texas.

The gasoline plant is designed to ultimately process 30,000,000 cu. ft. per day of inlet gas, but will handle only approximately 18,000,000 cu. ft. initially. It is a conventional oil-absorption plant and is designed to process wet gas at 700 psi.

The new plant will gather and strip casing-head gas from Pickton oil field and gas-well gas from Yantis field. The pressure-maintenance portion of the unit will compress the residue gas to approximately 2,700 psi. and inject it into the Pickton field pay.

Initial plant production at design conditions will recover daily approximately 13,250 gal. of propane, 11,500 gal. of butanes, and 9,000 gal. of natural gasoline. A truck-loading dock and tankage for 5-day product storage is installed in the plant area. A 20-car loading rack has been built along the L. & A. line approximately 2 miles northeast of Pickton.

Major equipment installed in the plant, in addition to the absorption, distillation, and fractionation vessels, includes gas-engine-driven compressors totaling 2,100 hp., 500 kw. capacity electrical generating equipment, and boilers totaling 600 hp. for steam-generating service. Fluor Corp., Ltd., constructed the plant.

Eleven employe cottages have been erected at Humble's Pickton production district residential camp, which is just west of the plant site. Approximately 25 employes will be needed to operate and maintain the plant.

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Among the Drilling Contractors

Upturn Again Reported in Number of Operating Rigs

Another upturn in the number of rotary rigs operating in the United States and western Canada was reported during the week ended August 22, bringing the total to 2,036 ft. This was 20 more than was reported during the preceding week and 39 more than for the week ended July 25 when the number dropped to the lowest level since January 31. The number still is 131 below the peak for this year, which was during the week ended April 25. Substantial increases in drilling activity were reported for the week in the West Texas and New Mexico and Pacific Coast areas. The number of active rigs by areas follows:

ROTARY RIGS IN OPERATION*
(United States and Western Canada)

Area—	Week ended 8-22-49	Change week ended 8-15-49	Change week ended 8-23-48
Gulf Coast	514	— 5	— 76
W. Tex.-N. M.	543	+32	— 68
Ark.-N. La.-E. Tex.	166	— 2	— 7
Oklahoma	233	+ 3	— 59
Kansas	104	— 9	— 38
Illinois-Eastern	126	— 3	— 29
Rocky Mountains	108	— 1	— 59
Pacific Coast	169	+18	— 12
Total U. S.	1,963	+33	—348
Western Canada	73	—13	+ 25
Total	2,036	+20	—323

*Courtesy Hughes Tool Co.

Milton Crow, Inc., is starting a 6,000-ft. wildcat test for Union Oil Co. on the latter's Ferguson lease in 11-7n-11w, 5 miles northeast of Many, Sabine Parish, Louisiana.

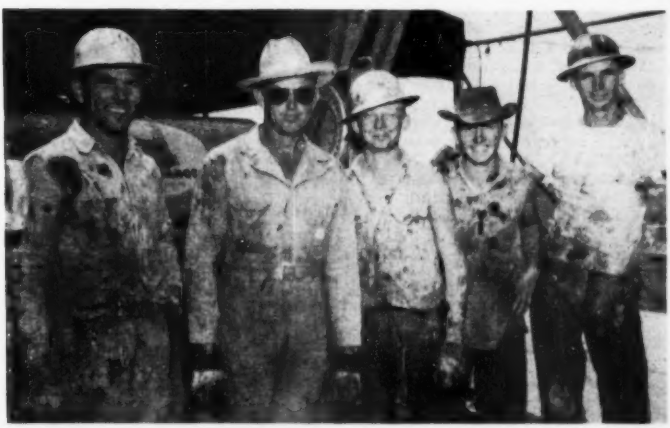
Regent Drilling Co., Ltd., Edmonton, has moved in equipment to drill Pan Western and associates 1 Kavanagh, a wildcat location about 14 miles southeast of the Leduc field, Alberta, Canada.

Kemp Drilling Co., Dallas, has been awarded two new drilling contracts in Mississippi, one for Sohio Petroleum Co. 4 Armstrong in the Ellisle field, and the other for Sun Oil Co. 2 Barnum in the South LaGrange field, both in Adams County.

Lyle Cashion, Inc., Laurel, Miss., is rigging up for a wildcat test to be drilled for Walter E. Sistrunk and Harris & Payne in Wayne County, Mississippi. Contract is for 5,000 ft. or 200 ft. in the Tuscaloosa. Location is 7 miles northeast of Waynesboro, on the Clark lease in 24-9n-6w.

N. V. Duncan, Oklahoma City, is the contractor on a wildcat test being started for Foundation Oil Co. in 21-26n-3w, 3½ miles northeast of Lamont, Grant County, Oklahoma.

Wright, Clark & Senkel Drilling Co., Graham, Tex., is moving in rig for a 5,200-ft. wildcat test to be drilled for Thomas D. Humphrey in the G. B.



Crew of Production Maintenance Co., Houston, drilling under contract for McCarthy Oil & Gas Corp. in the Pierce Junction field, Harris County, Texas Gulf Coast. Left to right: O. E. Liska, E. D. Wilson (driller), George Kostilnik, M. M. Bowen, and B. S. Rankin

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Cook Survey, A-89, 2½ miles southwest of the Jud field, Haskell County, Texas. It also has contract with the same operator for a test to be drilled in Block 14, H&TC Survey, A-505, a mile southwest of the recently completed Palo Pinto discovery well in the same county.

Devon Drilling Co., Edmonton, Alta., is moving in for a Devonian test to be drilled for Pacific Petroleums, Ltd., and Pike Drilling Co. in the Nestow area, 40 miles north of Edmonton. The test, 1 Nestow, is the first in Canada for Pike Drilling Co., a California contractor and operator.

Ward & McCullough Drilling Co., Wichita Falls, Tex., has the contract for Russell Maguire 2 Stewart, Block 19, J. H. Belcher subdivision, a development well to be drilled in the Maguire field, 2 miles west of Nocona, Montague County, West Texas.

Ideal Drilling Co., Casper, Wyo., is starting a test for Frontier Refining Co. in the Gurley area, Cheyenne County, Nebraska. The location is 3 miles northwest of the discovery well recently completed by Ohio Oil Co.

Powell & Peters Drilling Co., Inc., Great Bend, Kans., is drilling a wildcat for its own account on the Shaffer lease, in 11-20s-13w, Barton County, Kansas. Location is 1½ miles from production. This company recently has expanded its operations and opened offices in Oklahoma City.

Lawson Drilling Co., Tulsa, is drilling for its own account at 1 Gaines, NW SW 15-C39-PSL Survey, 2½ miles north of the Welch field, northwest Dawson County, West Texas. Location is on a Cities Service Oil Co. farm-out.

Commonwealth Drilling Co., Calgary, has contracted with Pacific Petroleums, Ltd., to drill a Devonian test in the Calahoo area, 20 miles northwest of Edmonton, Alta., Canada. Projected depth is 5,600 ft.

Penrod Drilling Co., Shreveport, is the contractor for Southwest Gas Production Co. and W. C. Feasel on a test being started in 17-20n-4w, a mile southwest of the Corinth townsite, Lincoln Parish, Louisiana.

Arrow Drilling Co., Tulsa, has moved in rig to drill Sells Petroleum Co. 1 Hackett, a semiwildcat a mile north of the Sand Flat field, Smith County, Texas.

Lloydminster Petroleum Drilling Co., Lloydminster, Sask., is starting another well for Inland Gas & Oil, Ltd., in the Viking-Kinsella gas field, central Alberta Province, Canada. It will be Inland 3 Viking-Kinsella, ½ mile west of No. 2.

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Exploration and Drilling

Regional Exploration Conventions

IN the past 7 years the amount of wildcat drilling in the United States has more than doubled. In 1949 we will drill about 7,000 exploratory wells, as against a little over 3,000 in 1942. Wildcat drilling costs a lot of money—we don't have to argue about that. What about the other exploration costs—those that are incurred prior to actually drilling the wildcat?

There are rough figures that indicate total exploration costs can be estimated at one-fourth for geological-geophysical work, three-fourths for wildcat drilling. For the purpose of this discussion, we can ignore lease bonuses and rentals, since they would be incurred whether or not the oil men used exploration scientists to pick the areas to be leased.

Evidently the oil men who put out cold hard cash have been reasonably well satisfied with the quality of work done by geologists and geophysicists. They have indicated this by expanding the number of such men about in proportion to the increase in exploration work. But what about the feelings of the exploration scientists themselves?

For one thing they have faced the fact that such a tremendous expansion in volume of work and manpower brings on some tough problems. For the first half of this 7-year period the war interfered with acquiring and training men. Moreover, training men for exploration work isn't exactly a simple thing. True they don't all have to be turned into executives or division geologists and geophysical district supervisors overnight. But the whole field of scientific knowledge has expanded so fast, and continues to grow so rapidly that it has been a rough job.

The professional societies in the exploration sciences have always been used to good advantage by the industry. In this rapid expansion, the societies have assumed their share of the responsibility. One of the first problems that had to be solved was numbers. Joint annual conventions of geologists-geophysicists-paleontologists have always been desirable. But the growth in numbers has outstripped convention facilities of all but three centrally located cities. These are Chicago, St. Louis, and New Orleans. And of these, New Orleans has voluntarily been out of the running, until it could digest some of its wartime growth.

Distance and expense made it prohibitive to send large numbers of the younger men to these annual meetings. Yet the younger men were the ones who were most in need of such benefits. The answer was an expansion of regional meetings. But what an expansion this has been! Not merely in number, but in the quality.

At Biloxi, Miss., on October 12-14, there will be a regional meeting. The sponsorship indicates the size of coverage. The geological societies are: East Texas, Mississippi, New Orleans, South Louisiana, Shreveport, and Tallahassee. For geophysics the sponsor is the Ark-La-Tex Geophysical Society. The subject matter of the papers covers the area from Eastern Texas to Florida, including offshore.

The program will be one of those balanced plans, with nine regional geological papers, four geological papers on specific fields, four geophysical papers, one paleontology paper, one on electric log correlation, and one on drilling problems in North Florida and South Georgia. There was a time, not too many years back, when such a program would have been considered pretty good for a national convention.

Biloxi will not be the only regional meeting in the next 12 months, but as the first of the fall season, it is certainly setting a high standard in programs. It is convincing proof that in the regional meeting, the professional societies are building up a device for offering high-class training for the younger members. The smart and alert younger men in that region are going to make every effort to get there; the executives are going to keep an eye on those younger men who try to improve their knowledge and training.

—Charles J. Deegan

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

WEST TEXAS.—Scurry County's prospects of becoming one of the largest reservoirs in West Texas continues to gain as additional development wells are completed and exploration tests bear out speculative contour maps. Popular opinion now is that Kelly, on the extreme south, and the two North Snyder fields will prove to be one continuous field. New locations, and wildcats now drilling, will soon prove or disprove the theory, and also link the north and south fields of North Snyder. And while the reef play continues to attract operators from all parts of the country, Standard of Texas 5-2 Brown, Section 440, was probing the Ellenburger, topped at 7,934 ft., or —5,494 ft.

TEXAS PANHANDLE.—Sinclair Oil & Gas Co. 2-B Lipps, northwest outpost to Lipps field, showed 10,300,000 cu. ft. of gas a day on a drill-stem test of the lower Pennsylvanian at 8,127-97 ft. Open flow was estimated as high as 36,000,000 cu. ft. daily, with a small amount of distillate. Gulf 1-C Harbaugh, 142-13-T&NO, Ochiltree County, found gas and distillate shows in lower Pennsylvanian while drilling at 10,256 ft.

ROCKY MOUNTAIN AREA.—Sinclair Oil & Gas Co. found oil in the Muddy and water in the Lakota on tests at its Happy Springs wildcat, Fremont County, Wyoming. Gas was recovered on drill-stem test in the Dakota at Husky Refining Co. and Continental Oil Co.'s Salt Wells, Wyoming, wildcat, following tests of gas in the Frontier. Sun Oil Co. completed arrangements with Sinclair for a farm-out of the latter's Big Elk Mountain structure, Bonneville County, Idaho, and will drill an 8,000-ft. wildcat in the new province.

KANSAS

Increased Discovery Rate Spurs Kansas Exploration

DISCOVERY of new pools in Kansas is proceeding at an accelerated rate with at least a half dozen wildcats in various counties showing for production. Of particular interest is the new Mississippi lime discovery of Barbara Oil Co. in Barton County. Located 7 miles east of Boggs pool, nearest production, and 11 miles north of the Oklahoma line, the well, 1 Page, SW SW SW 15-33-11, swabbed and flowed 97 bbl. of 24.5° oil in 7 hours after oil had risen 3,700 ft. in the hole. Casing, run to bottom at 4,610 ft., was perforated at 4,546-65 ft., with top of the Mississippi lime at 4,475 ft. (—3,040 ft.).

In Barton County, Ben F. Kroch, NW NW NW 19-17-14, 2 miles northwest of Carroll pool, swabbed 5½ bbl. of oil an hour, opening what appears to be another good pool. Production is from Arbuckle lime, topped at 3,399 ft. (—1,493 ft.), with open hole from 3,400 to 3,411 ft. Pay was given a 500-gal. acid treatment prior to testing. In the same county, Bay Petroleum Corp. 1 McCauley, NW NW SE 34-17-13, is another discovery, swabbing 6 bbl. an hour in an 8-hour test with casing perforated at 3,276-80 ft. in Lansing lime, topped at 3,139 ft. (—1,251 ft.). It is only ¾ mile southeast of Klug pool but is separated from production by dry holes. Previously, it had tested the Arbuckle at 3,376-3,400 ft., swabbing at the rate of ½ bbl. an hour, but operators elected to plug back to the Lansing. Pay, in each case, was acidized with 500 gal.

Tom Allan 1 Stahl, C SL NW 14-20-8, central Rice County, appears to be a new Misener sand discovery after flowing 3 to 4 bbl. of oil per hour on initial tests. Top of the sand is 3,315 ft. (—1,669 ft.) with bottom of the hole at 3,330 ft. and casing at 3,315 ft. Location is 1½ miles south of the old Lyons pool and 4 miles northwest of Wherry pool.

In northeastern Rice County, Atlantic Refining Co. recovered 100 ft. of oil and 140 ft. of oil and gas-cut mud in a drill-stem test at 3,092-3,100 ft. in Lansing at its 1 Hoffman, NW NE NE 32-18-6, another prospective new pool opener, but is drilling ahead to the Arbuckle. Lansing was topped at 2,747 ft. (—1,080 ft.). The discovery is a mile southeast of the abandoned Little River gas pool and 7 miles east of Genesee pool, nearest present production.

Musgrove Petroleum Co. 1 Hart, SW SW NE 36-22-14, new pool opener in Stafford County, pumped 472 bbl. per day on physical potential test from Arbuckle lime at 3,830-32 ft. Arbuckle was topped at 3,826 ft. (—1,900 ft.). It is 4½ miles south of Curtis pool and 3 miles southeast of Nellie pool. Two miles south of this well, Anschultz Drilling Co. is establishing another new pool at its 1 Smith, NW NW SW 24-22-14, which swabbed 15 bbl. of oil an hour from the same pay at 3,797-3,805 ft. (—1,870-78 ft.).

KANSAS SUCCESSFUL WILDCATS

Cowley County: K. T. Weideman 1 Staten, SW SW NW 32-32s-4e, pumped 20 bbl. of 41°-gravity oil per day from Bartlesville at 3,122-41 ft.; Kansas City 2,265 ft., basal Kansas City 2,785 ft., TD 3,141 ft.

McPherson County: Texas Pacific Coal & Oil Co. 1 Gabreilson, SE SW NW 33-17s-2w, 108 bbl. of 29.6°-gravity oil per day from Simpson at 3,557-70 ft.; Herrington 552 ft., Krider 570 ft., Winfield 599 ft., Towanda 660 ft., Ft. Riley 704 ft., Florence 754 ft., basal Florence 804 ft., Wreford 852 ft., Tarkio 1,460 ft., Topeka 1,807 ft., Heebner 2,114 ft., Toronto 2,138 ft., Douglas 2,151 ft., lime 2,284 ft., Lansing 2,344 ft., basal Kansas City 2,696 ft., Marmaton 2,728 ft., Cherokee 2,878 ft., Mississippian 2,975 ft., Kinderhook 3,170 ft., Hunton 3,286 ft., Sylvan 3,340 ft., Viola 3,464 ft., Simpson shale 3,547 ft., Simpson dolomite 3,554 ft., TD 3,570 ft.

KANSAS WILDCAT FAILURES

Clay County: El Capitan Oil Co. et al 1 R. Crawford, SE SE SW 1-7s-3e, dry, TD 3,255 ft., Kansas City 1,091 ft., Mississippian 2,138 ft., Hunton 2,353 ft., Maquoketa 2,785 ft., Viola 2,838 ft., Simpson 3,079 ft., Arbuckle 3,114 ft., quartz 3,162 ft.

Ellis County: Fred Anschutz 1 Miller, NE NE NW 26-12s-17w, dry, TD 3,835 ft., anhydrite 1,350 ft., Topeka 3,128 ft., Heebner 3,394 ft., Dodge 3,413 ft., Lansing 3,433 ft., conglomerate 3,711 ft., Simpson 3,780 ft., Arbuckle 3,785 ft.

Graham County: Virginia Drilling Co. 1 Jones, NE NE SE 11-9s-23w, dry, TD 4,124 ft., Lansing 3,650 ft., basal Kansas City 3,868 ft., Marmaton 3,962 ft., conglomerate 4,034 ft., Arbuckle 4,097 ft.

Marion County: C. W. Kelley et al 1 J. H. Wheeler, SE SW SW 27-20s-4e, dry, TD 2,511 ft., Mississippian 2,185 ft., Hunton 2,470 ft., Sylvan 2,476 ft., Viola 2,489 ft.

Pawnee County: Ben Brask Oil Co. 1 Clark, NW NW NW 3-21s-15w, dry, TD 3,745 ft., anhydrite 910 ft., Heebner 3,275 ft., lime 3,372 ft., Lansing 3,379 ft., basal Kansas City 3,595 ft., Viola 3,640 ft., Simpson 3,670 ft., Arbuckle 3,715 ft.

Rice County: Alkay Oil Co. 1 Alva Pool, NE NE NW 10-20s-7w, dry, TD 3,751 ft., Heebner 2,762 ft., lime 2,909 ft., Lansing 2,944 ft., conglomerate 3,333 ft., Viola 3,596 ft., Simpson 3,666 ft., Arbuckle 3,733 ft.

Russell County: N.C.R.A. ; P. Boxberger, NE NE NE 17-15s-14w, dry, TD 3,342 ft., anhydrite 815 ft., Topeka 2,696 ft., Lansing 3,050 ft., Heebner 2,988 ft., Leavenworth 2,992 ft., basal Oread 2,996 ft., Dodge 3,004 ft., Douglas 3,020 ft., Arbuckle 3,302 ft.

OKLAHOMA

Hughes County Gas Find Boosts McAlester Basin

SUBSTANTIATING showings obtained in a previously reported drill-stem test, Joe Josephson and V. E. Autry 1 Claude Meadows, NE NE SE 14-9n-12e, eastern Hughes County wildcat is being completed as a good gas well. With plug drilled out, it started flowing before drilling mud could be displaced and cleaned itself naturally in 35 minutes. Flow is estimated at 20,000,000 cu. ft. of gas daily. Located 2 miles southwest of Dustin and only a mile from the McIntosh County line on the northwest side of the McAlester basin, the discovery is providing additional incentive for the active wildcatting play getting started in that part of the state.

The recently opened Southeast Bebee pool in Pontotoc County is taking on added significance with the opening of a second producing horizon, the Calvin sand (Pennsylvanian), by W. A. Delaney, Jr., in his 1 Wilburn heirs, SW SE NE 4-4n-5e. Sand was topped at 1,438 ft. and drilled to 1,463 ft. A drill-stem test at 1,435-43 ft. showed gas immediately and flowed at the rate of 2,400,000 cu. ft. per day at 100 psi. pressure. Pressure built up to 580 psi. in 10 minutes when the well was shut in. A second drill-stem test taking in the lower part of the sand at 1,455-63 ft. resulted in a flow estimated at 2,250,000 cu. ft. per day with pressure of 45 psi. Shut-in. pressure built up again to 540 psi. Casing has been run to the top of the sand.

This well is about ¼ mile north of the discovery well and its confirmation well drilled by W. C. McBride, Inc., and producing from the Viola lime around 2,000 ft. The discovery well produces from casing perforations at 2,052-59 ft. The confirmation well, a 10-acre location west, has open hole in the pay at 1,937-58 ft. Currently drilling are a north offset to the discovery well by Sohio Petroleum Co. and a west offset to the confirmation well by McBride and Frank Buttram. Delaney is starting a Viola lime twin to the new Calvin sand gas well.

Showings encountered in the Wilcox in a wildcat being drilled by Flynn Oil Co. in northern Payne County indicate a possible new pool in that area. The wildcat is 1 Lucas, SW NE SE 29-10n-2e, about 12 miles northwest of Stillwater. First Wilcox was topped at 4,750 ft. A core at 4,745-53 ft. had black stains and an odor of oil. Three drill-stem tests of an interval at 4,744-55 ft. were made. The first gave a recovery of only 20 ft. of drilling mud. The second resulted in a recovery of 75 ft. of oil-cut mud. In the third, 180 ft. of fluid, including 60 ft. of oil and gas-cut mud and 120 ft. of water, was obtained. Hole is being deepened.

OKLAHOMA SUCCESSFUL WILDCAT

Osage County: Oliphant 1 Osage, NE NW NW 11-25n-8e, pumped 24 bbl. of oil per day from Mississippi chat at 2,331-78 ft., TD 2,381 ft.

OKLAHOMA WILDCAT FAILURES

Carter County: Lewis 1 Windblood, NW NE NE 32-1s-2w, dry, TD 1,895 ft.

Cotton County: Farris 1 State, NW NW SW 29-4s-10w, dry, TD 1,998 ft., sand 1,002-31 ft., 1,060-65 ft., and 1,879-1,905 ft., no shows, Megargel 1,932 ft.

Canadian County: Kingwood 1 Frye, C NE NE 15-14n-5w, dry, TD 7,036 ft., Avant 5,005 ft., Hogshooter 5,246 ft., second Checkerboard 6,242 ft., Oswego 6,712 ft., Inola 6,949 ft., Bartlesville 6,963 ft.

Garvin County: Richardson 1 Springer, NW SE SW 26-1n-1e, dry, TD 3,013 ft.

Sun Drilling 1 Brooks, SW SE SE 36-3n-3e, dry, TD 1,000 ft.

Stanolind Oil & Gas 1 Horn, NE SE NE 8-1n-2w, dry, TD 11,871 ft., base Pontotoc-top Deese 7,744 ft., basal Deese 7,914 ft., Mississippian Caney 8,985 ft., Woodford 9,550 ft., Hunton 9,800 ft., Sylvan 10,065 ft., Viola 10,135 ft., bromide 10,850 ft.

Hughes County: Maguire 1 Loftis, SE SE NE 9-3n-8e, dry, TD 2,675 ft., lime 2,220 ft., lower Booch 2,410 ft., Gilcrease 2,630 ft.

Jefferson County: Wilcox 1 Gover, SE SE SW 35-3s-9w, dry, TD 2,015 ft.

Noble County: Sell Petroleum et al 1 Rist, SE NE SW 7-21n-2w, dry, TD 5,564 ft.

Okfuskee County: Hanlon-Boyle 1 Winship, SW SW NE 32-10n-10e, dry, TD 3,882 ft., Senora lime 1,826 ft., Senora sand 1,844 ft., lime 2,422 ft., Booch 2,619 ft., Gilcrease 2,875 ft., sands 2,928 ft., 2,985 ft., 3,051 ft., and 3,075 ft., Union Valley 3,311 ft., Cromwell 3,353 ft., Mayes 3,740 ft., Woodford 3,834 ft., Misener 3,857 ft., Hunton 3,860 ft.

Berkey Oil 1 Meinholtz, SE SE SW 7-12n-7e, dry, TD 3,915 ft., Inola 3,530 ft., lime 3,670 ft., Gilcrease 3,790 ft., Union Balley 3,840 ft., no Cromwell, Caney 3,860 ft.

Pottawatomie County: Sadler 1 Brannone, SE SW NW 15-9n-4e, dry, TD 4,683 ft., Belle City 2,022 ft., Hogshooter 2,495 ft., Wewoka 3,035 ft., Senora 3,630 ft., Earlsboro 3,970 ft., Mayes 4,205 ft., Woodford 4,247 ft., Hunton 4,375 ft., Sylvan 4,428 ft., Viola 4,522 ft., dense 4,580 ft., Wilcox 4,665 ft.

Mabee & Allen 1 Miller, NE NW NW 6-5n-3e, dry, TD 4,742 ft., Hoxbar 3,045 ft., Layton 3,097 ft., Layton sand 3,103 ft., Wanette sand 3,830 ft., Woodford 3,193 ft., Hunton 3,987 ft., Sylvan 4,171 ft., **Ferndale Viola 4,308 ft. Trenton** Viola 4,380 ft., bromide dense 4,596 ft., second bromide sand 4,713 ft.

Stephens County: Crosby 1 Humphreys, NW NE NW 31-1n-6w, dry, TD 7,518 ft., Hoxbar (?) 5,310 ft., sands 5,895-5,925 ft., 6,005-55 ft., 6,060-6,125 ft., 6,130-90 ft., 7,060-75 ft., and 7,160-95 ft.

TEXAS GULF COAST

San Jacinto County Gets New Oil Pool

HOUSTON.—A new oil pool has been opened with the completion of the Floyd L. Karsten 1 Quinn-Bevil, which gaged 156 bbl. of 40.5°-gravity oil per day through a 3/16-in. choke, with 475 psi. tubing pressure. Hole is bottomed at 8,626 ft., and completion was made through perforations at 8,614-24 ft. Location of the well is in the B. B. Sturgess Survey, Abstract 277, 2 miles southeast of Mercy field, San Jacinto County.

Claud B. Hamil and J. M. Josey 1 Logenbaugh, in A. Roberts Survey Abstract 648, flowed 1,400 M.c.f. gas per day through a 10/64-in. choke, plus some 60.5°-gravity condensate, opening a new field 2 miles southwest of Cypress, Harris County. Production is through perforations at 7,024-36 ft., with 2,575-psi. tubing pressure.

Welder Ranch field has been extended 1 mile southeast of the 1 discovery well with the completion of Sterling Oil & Refining Co. B-2 J. J. Welder, S. A. Belding Survey, Abstract 144, Victoria County. The well was drilled to a total depth of 6,006 ft., and flowed gas through perforations at 5,654-66 ft. through 3/16-in. choke. The well is now waiting on potential test.

Houston Oil Co. of Texas A-1 B. W. Trull, wildcat test in the Francitas area of Jackson County, promises to open a new pool. On a 15-minute drill-stem test at 7,950-61 ft., the well recovered 1,150 ft. of pipe-line oil and 120 ft. of salt water through ¼-in. choke. Operators are now drilling below 10,200 ft. in hard sand, shale with shaly sand streaks.

Ohio Oil Co. and Melben Oil Co. have spudded the 1 State of Texas, wildcat 30 miles southwest of Freeport in the Gulf of Mexico. Operators have drilled to 415 ft. and are waiting on cement after setting 18⅝-in. casing at 348 ft.

The 52 new locations on the Texas Gulf Coast include 10 wildcat starts, 1 each in Fayette, Harris, Liberty, San Jacinto, Wharton, Bee, Jackson, and Victoria counties, and 2 in Lavaca County. There were 4 successful exploratory tests completed, 1 each in Brazoria, Harris, Matagorda, and San Jacinto, while 10 were dry, 1 each in Bee, Calhoun, Goliad, Victoria, and Harris counties, 2 in Jackson County, and 3 in Matagorda County.

TEXAS GULF COAST (DISTRICTS 2 AND 3) SUCCESSFUL WILDCATS

Brazoria County: New oil pool—Freeport Sulphur Co. A-2 Freeport Sulphur Co., in Henry Burt Sur., A-151, 3½ mi. SW of Freeport, TD 1,388 ft., top sand 1,360 ft., IP: 55 bbl. oil per day, open hole, GOR 260, TP 225 psi., 33.5°-gravity.

Harris County: Gas-condensate discovery—Claud B. Hamil & L. M. Josey 1 H. J. Longenbaugh, in A. Roberts Sur., A-648, 2 mi. SW of Cypress townsite, TD 7,075 ft., perf. 7,024-36 ft., IP: 1,400 M.c.f. gas per day plus some condensate, 10/64-in. choke, shut in.

Matagorda County: Gas discovery—H. A. Potter 4 Henry T. Freeman, in Sargent area, Thos. McCoy & D. Deckro Sur., top sand 6,324 ft., TD 6,600 ft., perf. 6,331-52 ft., IP: 72,000 M.c.f. gas per day, open flow gage, SIP 2,515 psi.

San Jacinto County: New oil pool—Floyd L. Karsten 1 Quinn-Bevil, in B. B. Sturgess Sur., A-277, 5 mi. N of Fostoria, 2 mi. SE of Mercy field, top sand 8,616 ft., TD 8,626 ft., perf. 8,614-24 ft., IP: 155 bbl. oil per day, 3/16-in. choke, GOR 1,325, TP 475 psi., 40.5° grav.

TEXAS GULF COAST (DISTRICTS 2 AND 3) WILDCAT FAILURES

Bee County: H. R. Smith-Big West Drilling Co., Spartan Drilling Co. 1 Bernard Seger, in Geo. O'Docharty Sur., 2 mi. NW of Youngeen, dry, TD 4,259 ft.

Calhoun County: John W. Mecon 2 Minnie C. Welder, in Dry Land & Cattle Co. Sur., 3 mi. E-SE of Yeyser field, dry, TD 9,630 ft.

Goliad County: Placid Oil Co. 1 Sol Parks, in Juan Rener & Son Sur., A-34, 3 mi. NW of Old Fannin gas field, dry, TD 4,482 ft.

Harris County: Gulf Oil Corp. 2 Katie Ward, No. Flank Mykawa, in J. Lovett Sur., A-526, dry, TD 8,944 ft.

Jackson County: Edwin B. Cox & Jake L. Hamon 1 Charlotte Carstens, in Geo. House Sur., 6 mi. NE of Ganado, dry, TD 6,210 ft.

Newman Bros., Alaska Steamship Co., Calvert Corp. & J. E. Mowinckle 1 J. E. Cooper et al, in F. F. Wells Sur., 6 mi. S of Edna, dry, TD 7,010 ft.

Matagorda County: Fullerton Oil Co. 1 Grace P. Heffelfinger, in J. E. Wallace Sur., 2 mi. S of Midfield in No. Blessing area, dry, TD 10,726 ft.

Miles Production & A. D. Lee 1 B. A. Ryman, in Ira Ingram Sur., A-49, dry, TD 5,640 ft.

Renwar Oil Corp. & P. P. Rutherford 1 J. L. Jordan, in J. Tilley Sur., 1 mi. NW of Blessing, dry, TD 10,079 ft.

Victoria County: Baldridge & King 1 S. J. Williams, in C. de la Garza Sur., A-46, ½ mi. W of Anaqua field, dry, TD 6,050 ft.

MICHIGAN

Traverse Oil Show Logged In Bay County Test

MOUNT PLEASANT.—A Traverse oil show was logged in another Pinconning Township wildcat, Bay County, by Don Rayburn, and this zone was being prepared for a production test. Rayburn's 2 Cooper-Lucht, NE SW NE 29-17n-4e, diagonal northeast 20-acre offset to same operator's first Traverse zone wildcat, which is still under test, showed 1,700 ft. of oil, 88,000 cu. ft. of gas, and 30 ft. of salt water on drill-stem test in this zone at 2,230-38 ft. To keep hole in condition for eventual deepening to the Dundee, if desired, a string of 7-in. casing was run and cemented at 2,232 ft. Spudder was beginning to clean out cement.

Rayburn was also testing the Traverse pay on the 1 Cooper-Lucht, SW SW NE 29-17n-4e, after hole was plugged back from 2,242 ft. to 2,236 ft. in an effort to shut off bottom-hole water. This wildcat has produced a total of 300 bbl. of oil for a daily average of about 20 to 25 bbl. for each day that tests have been conducted. Tubing was run in an effort to "skim" the oil off the water showing after a plugback.

A half-mile south extension bid to the Isabella Dundee oil field, Isabella County, missed a commercial pay, but plans were being completed to retest a Stray sand gas pay logged below 1,485 ft. The test, Alan Gray 1 Miller et al, NW NE NW 19-15n-4w, logged Dundee top at 3,800 ft., a small oil show at 3,808-10 ft., and was bottomed out at 3,817 ft. Hole carried 80 ft. of oil and 40 ft. of salt water after a 48-hour shut-in period. This show was acidized with 500 gal., but the acid appeared to have increased the water, but not the oil. No gage of the Stray was made when drilled, but a blowout, which occurred when 7-in. casing was set at 1,760 ft., appeared to indicate that a gas sand had been drilled. Top of Stray sand was logged at 1,485 ft.

MICHIGAN WILDCAT FAILURES

Isabbella County, Isabella Township: Merrill Drilling Co. 1 Paisley-Sobiski, NW SE NE 29-15n-4w, Dundee 3,807 ft., dry, TD 3,814 ft.

Newaygo County, Barton Township: H. E. Bell 1 Almos, SW SW NE, 5-16n-11w, dry in the Marshall, TD 1,625 ft.

N. CENTRAL TEXAS

Jack County Well Due For Completion Test

WICHITA FALLS.—Mid-Continent Petroleum Corp. prepared to set pipe for completion tests at its 1-A C. W. Fowler, C. H. Simpson Survey, 8 miles northwest of Jacksboro in Jack County.

A 2-hour drill-stem test from 6,479-6,507 ft. brought gas to the surface in 31 minutes, and recovered 15 ft. of high-gravity oil, plus 110 ft. of heavily oil-cut drilling mud. Bottom-hole pressure was 2,250 psi. in 20 minutes.

Operators then drilled to 6,559 ft., and drill-stem tested ffrom 6,507 ft. In 2 hours recovery was 3,180 ft. of salt water. Electrical surveys were to be run before setting casing.

C. G. Glasscock and Pontiac Refining Co. 3 Morris, J. U. Fields Survey, northwest Jack County, continued to flow approximately 2 bbl. of oil an hour through ¼-in. choke, from perforations at 5,812-30 ft. Location is 7 miles west of Chico. The same operators' 1-A Morris, one location northwest of the 3 Morris, was drilling below 5,868 ft., and showing some 4,000,000 cu. ft. of gas a day.

Thirteen miles north and slightly west of Jacksboro, Henry Grace Production Co. 4 Lindsey, I. N. Wright Survey, was drilling below 5,226 ft. after a 1-hour test at 5,206-26 ft. recovered 45 ft. of drilling mud.

Parker County.—Buz Morgan et al 1 O'Neal, M. Waugh Survey, 3½ miles northwest of Springtown, recovered 55 ft. of gas-cut mud, with no oil, on a 2-hour drill-stem test of the Ellenburger at 6,640-70 ft. Coring continued below 6,670 ft.

Taylor County.—Two miles southwest of the town of Lawn, southeast corner of the county, J. P. Production Co. and others, of Abilene, prepared to drill the 2 Atwood as an east offset to the recent Gardner sand discovery. Location is 330 ft. from north and east lines, James C. Thompson Survey 433. Contract depth was 4,200 ft., with rotary.

Humble Oil & Refining Co.'s north offset, 1 J. M. Wagstaff, Block 432, A. Winters Survey, was drilling below 2,735 ft. in shale. It is on a 4,500-ft. permit.

Three miles northeast of Abilene, Geochemical Surveys 2-A City of Abilene, Section 81, E. Anderson Survey, recovered 200 ft. of oil and 100 ft. of salt water on a 90-minute drill-stem test of the Bluff Creek section at 1,688-95 ft. Operators prepared to test the Saddle Creek, at 1,703 ft., total depth.

Humble 3 J. S. Pinckley, 1½ miles northeast of Merkel, 1-12-Grimes CSL, prepared to acidize perforations at 2,709-13 ft. It is a northeast offset to the Ingram discovery and has encountered water in the regular pay zone.

Clay County.—Jack Grace Producing Co. 1 Scaling & Cobb, J. Scott Survey, 2 miles east of the Watson field, and 7½ miles northwest of Shannon, was showing for Caddo production. A drill-stem test, open 2½ hours, from 5,580-5,600 ft., had gas in 30 minutes and recovered 20 ft. of oil and 70 ft. of heavily oil-cut mud. After surveying, drilling continued below 5,640 ft.

L. T. Burns 1 C. W. Scaling, Block 89, J. H. Belcher Survey, east outpost to the Lazy B field, had promises of being one of the county's largest producers when it gaged 105 bbl. of oil, cut slightly with wash water, in 1 hour. Plug was drilled on 5½-in. casing, set at 5,543 ft., mud replaced with water and the swab run three times when the well kicked off, and was cleaned into tanks.

NORTH CENTRAL TEXAS (DISTRICTS 9 AND 7-B) SUCCESSFUL WILDCATS

Erath County: Amburgey-McClung-Amburgey 1 W. R. Miller, T. Harrell Sur., 5 mi. SE Thurber, pumped 41 bbl. 40°-grav. oil a day, Ellenburger 3,952-82 ft., TD 4,002 ft.

Jones County: Latimer Bros. et al 1 H. C. Harvey, J. Gasner Sur. 8, 1 mi. SE Nugent, pumped 43 bbl. 38°-grav. oil in 8 hours, oil sand 1,702-17 ft., TD 1,720 ft.

Shackelford County: Great Expectations Oil Corp. 1 Chloe A. Nail "B," 126-1-ETRR, 21 mi. NW Albany, pumped 49 bbl. 36.8°-grav. oil a day, pay 1,320 ft., TD 1,328 ft.

Throckmorton County: Deep Rock Oil Corp. 1 T. W. Foreman, Sec. 3040, TE&L Sur., 8 mi. NE Throckmorton, pumped 52½ bbl. 40°-grav. oil a day, Caddo 4,496-4,540 ft., TD 5,311 ft., PB 4,550 ft.

Wichita County: Frank Wood 1 W. T. Waggoner "V," Sec. 13, HT&B Sur., A-137, ½ mi. S Electra, pumped 23½ bbl. 41°-grav. oil a day, oil sand 1,529-31 ft., TD 2,205 ft., PB 1,587 ft.

Wilbarger County: Lawrence Hillhouse 1 George Rice, Sec. 405, TE&L Sur., 6 mi. W Olney, pumped 56 bbl. 38°-grav. oil a day, pay 1,287-1,293 ft., TD.

NORTH CENTRAL TEXAS (DISTRICTS 9 AND 7-B) WILDCAT FAILURES

Archer County: L. A. Hedrick 1 E. A. Hausler, Jacob Standerford Sur., A-394, 2½ mi. N Olney, dry, TD 1,190 ft.

Wilcox Oil Co. et al 1 H. M. Sissoms, H. Spivey Sur., 1 mi. SW Dundee, dry, TD 2,394 ft.

Baylor County: Blackwell Oil & Gas Co. 1-A Burrell Mills, Sec. 2427, TE&L Sur., 2½ mi. SW Megargel, dry, TD 1,427 ft., Gunsight lime 1,414-16 ft., light oil show 1,421 ft.

Brown County: Viking Oil Corp. 1 L. D. Cox, Sec. 30, HT&B Sur., 3½ mi. NW Grosvenor, dry, TD 2,440 ft., light oil show 2,239-51 ft.

Comanche County: United North & South Development Co. 1 Junior Files, Sec. 51, D&DA Sur., 1½ mi. NE Sipe Springs, dry, TD 710 ft.

Eastland County: L. W. Roche 2 D. M. Reeves, Sec. 66, H&TC Sur., 3 mi. NE Gorman, dry, TD 3,275 ft., show dead oil 2,820 ft.

Fisher County: Roeser & Pendleton, Inc., 1 Landy Jameson, NE NE 109-1-H&TC, 15 mi. NW Hamlin, 2 mi. E Rotan field, dry, TD 6,195 ft., Mississippian 6,020 ft., Chappell 6,055 ft., Ellenburger 6,150 ft., elev. 1,839 ft.

Haskell County: Roark, Hooker & Roark et al 1 R. C. Couch, Sec. 76, J. Williams Sur., A-416, 7 mi. NE Haskell, dry, TD 4,476 ft., Valera 765 ft., Saddle Creek 1,930 ft., Reef 2,995 ft., Strawn 4,405 ft., elev. 1,515 ft.

Montague County: T. J. Carter 1 W. F. Robertson, Sec. 67, Panola CSL, 2 mi. N Sunset, dry, TD 6,284 ft., tested Strawn 5,154-64 ft., no shows, top Caddo 5,792 ft., elev. 992 ft.

The Texas Co. 1 W. E. Sampson, A. McCart Sur., A-923, 6 mi. SE Bonita, dry, TD 2,064 ft., slight show of oil on DST at 2,571-2,660 ft.

Stephens County: R. G. Drilling Co. 1 W. H. Green, Sec. 1299, TE&L Sur., 5 mi. NW Breckenridge, dry, TD 4,462 ft., Caddo 3,285 ft., Marble Falls 3,851 ft., Ellenburger 4,570 ft., elev. 1,184 ft.

Taylor County: West Central Drilling Co. 1 Wilmer Criswell, Blk. 2, League 148, Grimes CSL, 2 mi. N Merkel, dry, TD 3,595 ft., Swastika sand 3,063 ft., Reef 3,582 ft., no shows, elev. 1,841 ft.

Wichita County: Gem Oil Co. 2 W. P. Ferguson, Blk. 16, WVFL Sur., 2 mi. SW Kamay, dry, TD 4,524 ft., Caddo 4,110-46 ft., light oil show.

Wilbarger County: Oltex Drilling Co. 1 J. C. Thompson, Sec. 217, TE&L Sur., 4 mi. SE Olney, dry, TD 914 ft., Gunsight lime 837 ft.

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SOUTH LOUISIANA

New Pool Opening in St. James Parish

NEW ORLEANS.—A new oil pool is being opened in St. James Parish by Humble Oil & Refining Co. 2 Burton-Schwartz Land Corp., wildcat in 51-12s-15e. On a 2-hour test made at 10,838-48 ft., the well flowed 269 bbl. of 52°-gravity oil per day, with 3,450-psi. flowing pressure on the tubing.

Atlantic Refining Co. has completed 1 Albert Meche as an oil producer. The well flowed 45 bbl. of 56.5°-gravity oil per day through ⅛-in. choke, with tubing pressure of 3,300 psi. Hole is bottomed at 9,898 ft., and production is through perforations at 9,474-82 ft. Location is 9-7s-3e, 4 miles northwest of Shuteston and 7 miles southwest of Opelousas, St. Landry Parish.

Magnolia Petroleum Co. continues to test the 1 Eugene Island, Block 125, State Lease 363, St. Mary Parish. The first three tests had no shows, and Magnolia has indicated that if four particular zones prove fruitless, the hole will be plugged and abandoned.

In Block 51 of Eugene Island area, Magnolia B-1 State Lease is drilling below 9,800 ft. in sand and shale. Projected depth of the well is 12,000 ft.

Barnsdall Oil Co. is completing the 5 Breton Sound 1227, wildcat in Block 32, Breton Sound, Palquemines Parish. On drill-stem test at 5,802-04 ft., the well flowed 230 bbl. of 24.6°-gravity oil through 5/32-in. choke with tubing pressure of 700 psi.

The 24 new locations in South Louisiana include 3 wildcat starts, 1 each in Acadia, Beauregard, and Plaquemines parishes. There were two exploratory tests completed, one successful in St. Landry Parish and one dry in Lafourche Parish.

SOUTH LOUISIANA SUCCESSFUL WILDCAT

St. Landry Parish: New oil pool—Atlantic Refining Co. 1 Albert Meche, 9-7s-3e, 4 mi. NW of Shuteston, top sand 9,474 ft., TD 9,898 ft., perf. 9,474-82 ft., IP:

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SOUTH LOUISIANA WILDCAT FAILURE

Evangeline Parish: Sun Oil Co. A-1 Gradnigo Unit, at Cane Creek, 9-5s-2w, dry, TD 12,523.

APPALACHIAN FIELD

Important Wildcat Finaled In Unity Township

PITTSBURGH.—An important deep wildcat test was completed in Unity Township, Westmoreland County, Pennsylvania, in Peoples Natural Gas Co. 1 Wm. Piper, elevation 2,061 ft., after acidizing tested 240,000 cu. ft. of gas, Onondaga lime 8,130 ft., chert 8,158 ft., gas 8,223 ft. (acidized), Oriskany sand 8,301-60 ft.; total depth 8,552 ft. In Derry Township, this company's 4-3814 Camilla Giffen, elevation 2,238 ft., is drilling at a depth of 8,748 ft. In Napier Township, Bedford County, South Penn et al-Snee & Eberly 1 Jessie B. Miller, elevation 1,666 ft., is drilling at 3,875 ft. In Wharton Township, Fayette County, William E. Snee et al 3 Indian Creek Coal & Coke Co., elevteion 2,615 ft., is drilling at 5,395 ft.; and, in Georges Township, Orville Eberly et al 1 N. E. Murphy ran 10-in. casing at 421 ft. and drilling is at 485 ft.

New locations reported in Southwest Pennsylvania were eight: Burrell and Red Bank townships, Armstrong County; Perry Township, Greene County; Nottingham and Peters townships and Twilight Borough, Washington County; and Allegheny Township, Westmoreland County.

In Glade district, Webster County, West Virginia, Hope Natural Gas Co. 9227 West Virginia & Pittsburgh Railroad Co., elevation 2,512 ft., is shut down at 7,277 ft. after reaching the Oriskany sand which was topped at 7,274 ft. In Reno district, Preston County, Snee & Eberly 1 Dola E. Dever, elevation 1,508 ft., logged the Oriskany sand at 5,321 ft. and drilling is at 5,368 ft. A new location for a wildcat test in this county was made by Hope Natural Gas Co. in Portland district, 9391 John and Edna Murphy, elevation 2,152 ft. It is located on the Kingwood Quadrangle, 4.5 miles south of Lat. 39°, 30′, and 3.85 miles west of Long. 79°, 30′. In the Waterbury discovery-well section, Grant district, Jackson County, United Carbon Co. et al 1-1622 L. C. Sheppard reached the Oriskany sand at 5,021 ft. and encountered a small show of gas at 5,033 ft.; drilling is at 5,041 ft. In this same section, but in Steele district, Wood County, Limestone Gas Co. 1 L. W. Pfalsgraf topped the Corniferous lime at 4,933 ft. and 5-in. casing is being set at a depth of 4,950 ft.

Twenty-six new locations were reported in West Virginia: Cove district, Barbour County; Lee district, Calhoun County; Center district, Gilmer County; Malden district, Kanawha County; Courthouse district, Lewis County; Mannington district, Marion County; Harvey district, Mingo County; McKim and Washington districts, Pleasants County; Portland district, Preston County; Pocatalco district, Putnam County; Clay and Union districts, Ritchie County; Grant and Union districts, Wayne County; Grant district, Wetzel County; Burning Springs and Clay districts, Wirt County; Walker district, Wood County; and Baileysville district, Wyoming County.

PENNSYLVANIA SUCCESSFUL WILDCAT

Westmoreland County, Unity Township: Peoples Natural Gas Co. 1 Wm. Piper, elev. 2,061 ft., 240,000 cu. ft. gas after acidizing, Onondaga lime 8,130 ft., chert 8,158 ft., gas 8,223 ft., Oriskany sand 8,301-60 ft., TD 8,552 ft.

SOUTHWEST TEXAS

Humble Deep Wildcat Awaiting Potential Test

CORPUS CHRISTI.—Humble Oil & Refining Co. 1 R. J. Kleberg, trustee, wildcat, 6 miles southeast of Encino, Brooks County, is bottomed at 10,382 ft., and is now waiting on potential test, with a gas-distillate well indicated. The well was swabbed for 25 bbl. of distillate per day, plus 12,000 cu. ft. of gas from open hole; with 900 psi. tubing pressure.

J. M. Turkel has temporarily abandoned the B-1 J. B. Burns, a wildcat in Guadalupe County, after sticking drill pipe. Total depth of the well is 2,648 ft. Twenty feet of saturation at the top of the Austin Chalk and also a show of oil at 2,144-54 ft. were encountered.

An attempt to extend Wolf Creek field 1,600 ft. east-southeast failed when Parker Petroleum 1 A. E. & C. O. Appling was abandoned at total depth of 2,346 ft., with no shows worthy of testing.

Thomas & Rogers are reported to have discovered a new horizon in Chapman Abbott field of Williamson County. Total depth of the well is 2,100 ft., and the new pay sand just above that interval. Well is located in the Miller Survey, 376 ft. southwest of H. H. Coffield 1 well, 18 miles southeast of Taylor.

John W. Mecom 2 Minnie S. Welder, Calhoun County wildcat, in Day Land & Cattle Co. Survey, A-228, was fishing at 6,300 ft. Total depth of the well is 9,700 ft.

Atlantic Refining Co. has set 5½-in. casing at 7,800 ft. in 1 State Tract 430. It is now waiting on cement at a total depth of 7,893 ft. Location of the well is ap-

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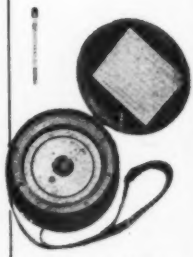

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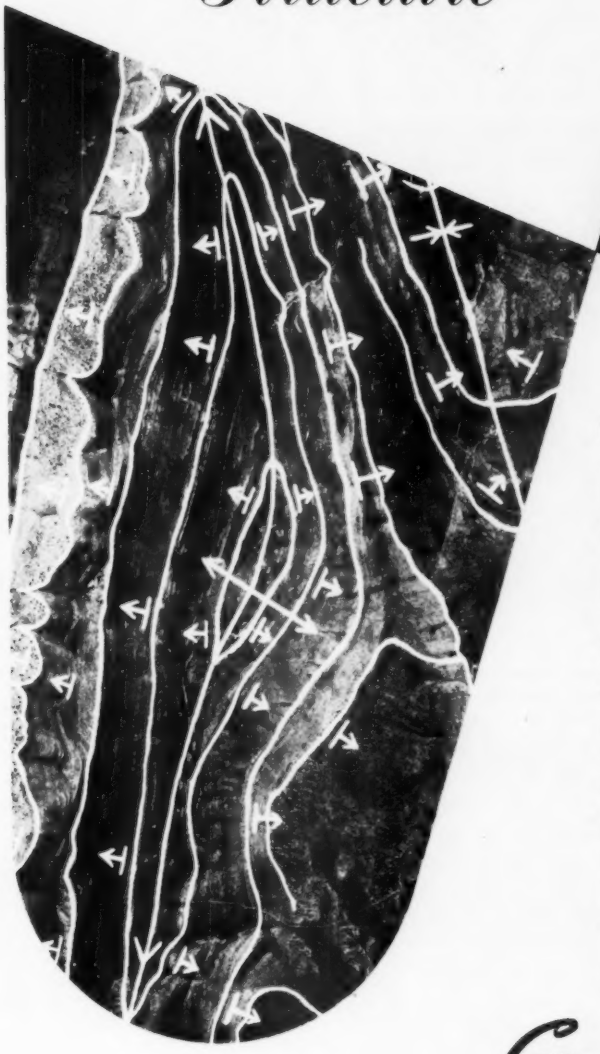

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proximately 8 miles southwest of Port Aransas, Nueces County.

The 35 new locations in Southwest Texas include 16 wildcat starts, 1 each in Atascosa, Bastrop, Frio, McMullen, Travis, Williamson, Hidalgo, Jim Hogg, Live Oak, Aransas, and San Patricio counties, 2 in Coldwell, and 3 in Guadalupe County. There were 15 dry exploratory wells completed, 1 each in Guadalupe, Zavala, Duval, Jim Hogg, and Zapata counties, and 2 each in Caldwell, McMullen, San Patricio, and Webb counties.

SOUTHWEST TEXAS (DISTRICTS 1 AND 4) WILDCAT FAILURES

Caldwell County: W. Earl Rowe et al 1 H. M. Reed Est., in John Talbot League 42, 3½ mi. SE of McMahon, dry, TD 3,997 ft.

Roy L. Turner & Alcan Oil Co. 1 George Mackay, in J. Burleson Sur., A-3, 4 mi. NW of Dale, dry, TD 3,908 ft.

Duval County: Plymouth Oil Co. 1 A. C. Jones, in Block 56, 4th addn. La Copita Farm & Garden trs., 7 mi. SE of Crestonia, dry, TD 5,777 ft.

Guadalupe County: Pryor Dillard 2 Nolte Farm Est., in John Sowell League, 3 mi. SE of Seguin, dry, TD 1,943 ft.

Jim Hogg County: Dulaney Oil Co. 2 Robert Holbein et al, in Las Animas grant, 15 mi. S of Mirando City, dry, TD 2,153 ft.

McMullen County: Jergins Oil Co. 1 Nueces Land & Livestock Co., in T. Roziene Sur., A-805, 3½ mi. NE of Munson field, dry, TD 1,750 ft.

Utah Oil Corp. 1 Nueces Land & Livestock Co., in Theo Roziene Sur., A-994, 2 mi. NE of Munson field, dry, TD 1,393 ft.

San Patricio County: Quintana Petroleum Corp. 1 August Guettler et al, in Geo. Sargent Sur., 3½ mi. N of Gregory, dry, TD 10,680 ft.

Curtis Singleton Drilling Co. 1 Allen Shivers, in Geo. H. Paul Subd., 2 mi S of Sinton, dry, TD 7,037 ft.

Webb County: Gordon W. Johnson A-2 Dan Adami, in H&GN Sur. 3, A-1429, 4 mi. SW of Adami field, dry, TD 1,066 ft.

O. W. Killam 1 Bruni Est., in AB&M Sur. 129, 1¼ mi. E of Quien Sabe field, dry, TD 4,154 ft.

Zapata County: C. H. Lewis 1 Helen Kahn Pellegrin & A. G. Pellegrin, 4 mi. SE of Escobas, 1¼ mi. SE of Escabor field, dry, TD 2,220 ft.

Zavala County: T. P. Cannon 1 Albert Fenley, in I&GN RR Co. Sur., A-286, 22 mi. SW of Uvalde, dry, TD 5,933 ft.

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MISSISSIPPI

Testing of Jefferson County Well Scheduled

JACKSON.—Danciger Oil & Refining Co. 1 Kate Logan, Jefferson County, commenced coring after running drill-stem test at 9,414 ft. which recovered 8 ft. of gas and condensate-cut mud. Several cores were taken with shows at the 9,451-56-ft. interval. Total depth of the well is 9,456 ft., with 7-in. casing set on bottom. Actual testing of the well will commence within the week.

Sinclair Wyoming Oil Co. is preparing for a test in this area, but definite location will not be made until final results on 1 Logan have been released.

Additional storage has been erected at Stanolind Oil & Gas Co. 1 J. B. Dockery, 17-10n-2e, Jefferson County, but the well has not been successfully completed. The well was swabbed in and flowed approximately 16 bbl. of oil in 4 hours through ½-in. and 24/64-in. chokes and died. Operators are now swabbing and attempts will be made to run a 24-hour test.

A diagonal southeast offset to Big Chief Drilling Co.-W. B. Osborn 1 George Ziegler will be drilled by C. H. Murphy, Jr., of El Dorado, Ark. The well will be a Massive sand test, located in SE NW Section 2.

Location is being cleared for The California Co. 1 Mrs. Cora L. Collins et al Unit, wildcat, in 2-3n-11e, Walthall County.

Operations have been resumed at the George Vasen 1 Tung Oil Corp., wildcat, 9-2s-11w, Stone County, which has been shut down for the past 9 months. The well was shut down at 14,038 ft., after extensive perforating from 11,300 to 13,665 ft. failed to show any sands of commercial value. The wildcat will be deepened an additional 2,500 ft., which, if drilled according to plans, will set a new record for the state of 16,538 ft.

The 10 new locations in Mississippi include 4 wildcat starts, 1 each in Adams, Carroll, George, and Lamar counties. There were three exploratory tests completed, all dry, one in Adams County and two in Franklin County.

Florida had one new wildcat start in Lafayette County, and two dry exploratory tests completed, one each in Columbia and Levy counties.

MISSISSIPPI WILDCAT FAILURES

Adams County: James E. Kemp-H. W. Elliott 1 Mrs. Helen Gousett, 25-6n-3w, dry, TD 6,640 ft.

Franklin County: Richard A Campbell 1 Albert Krauss et al, 3-7n-2e, dry, TD 6,513 ft.

L. M. Lockhart 1 U. S. A., 27-6n-4e, dry, TD 11,026 ft.

FLORIDA WILDCAT FAILURES

Columbia County: Sun Oil Co. 1 Ruth M. Bishop, 10-4s-17e, dry, TD 4,828 ft.

Levy County: Humble Oil & Refining Co. 1 C. E. Robinson, 19-16s-17e, dry, TD 4,606 ft.

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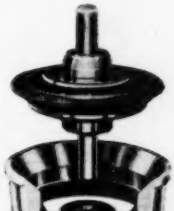

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ROCKY MOUNTAIN

Sinclair Will Deepen Happy Springs Wildcat

DENVER.—Sinclair Oil & Gas Co. had a disappointment in tests of the Lakota at its wildcat at 1 Unit, SE SW SW 16-28n-93w, Happy Springs, Fremont County, Wyoming. The well made 4,140 ft. of water in 45-minute drill-stem test in that formation between 6,705-6,740 ft., and the operator will drill the wildcat deeper. The well has made oil on drill-stem tests of the Frontier and Muddy formations, and will apparently be a new discovery regardless of results of deeper drilling. On test in the Muddy between 6,554-6,600 ft. the well made 2,963 ft. of 37°-gravity green, sweet oil and 212 ft. of gas-cut mud in 65 minutes. Top of Muddy was logged at 6,535 ft. Two weeks ago the well made 728 ft. of 35°-gravity oil in 64 minutes on test between 5,888-5,917 ft. in the Frontier formation. Lakota was considered a primary shot in the wildcat due to its location west of Crooks Gap field, which produces oil from Muddy and Lakota sands. The Happy Springs wildcat is scheduled to test Tensleep prior to completion.

Gas was recovered on drill-stem test in the Dakota at the Husky Refining Co.-Continental Oil Co. Salt Wells wildcat at 1 Unit, C SW NW 11-14n-103w, Sweetwater County, Wyoming, this week. The top of Dakota was logged at 6,360 ft. and on drill-stem test between 6,260-85 ft. the well flowed at the rate of 1,715,000 cu. ft. of gas daily, and further drilling and coring has shown additional gas sand. Gas was also logged in the Frontier formation on this wildcat, with an estimated volume of 10,000,000 cu. ft. from that zone. This unit is located between the Canyon Creek-Hiawatha area and Baxter Basin field, which produces gas from the Nugget. The Husky-Continental well is a proposed Nugget test.

Of interest to all Rocky Mountain operators was an announcement made by Sun Oil So. and Sinclair Oil & Gas Co. of completion of farm-out arrangements whereby Sun will drill its first Rocky Mountain wildcat in recent years. Sun has committed itself to an 8,000-ft. wildcat, to test Pennsylvanian, for one-half interest in Sinclair's Big Elk Mountain area, Bonneville County, Idaho, in an area where there has been no previous deep drilling. Location has been made for 1 Unit, SW NW SE 23-2s-44e, and contract for an expensive road is now being let by Sun. The well will start in Jurassic and has several possible producing formations as objective, including the Wells sandstone (Pennsylvanian).

Upon completion of this wildcat, Sun may elect to drill an additional four wildcats on other structures leased by Sinclair in the new province. Sinclair has a total of 108,500 acres on the five structures. Carter Oil Co., Stanolind Oil & Gas Co., and others have blocks throughout this eastern Idaho area and in the event of discovery by Sun it is expected that a great deal of wildcat drilling will result.

Amerada Petroleum Corp. may be in Lakota at its important Smith Cut wildcat at 1 Unit, C SE SE 10-44n-79w, Johnson County, Wyoming. The wildcat is now reported below 13,275 ft. and no previous sand reservoirs have been drilled in the well. This wildcat is north of the Sussex area, where Continental has several wells producing from the Lakota sand at shallower depths. The Amerada wildcat was located on the west side of Powder River basin following extensive seismic work through this area.

New locations.—There were 13 new locations made, 9 in Wyoming, 3 in Montana, and 1 in Utah. These were all for pool wells except the Promontory Oil Co. 1 Jensen, C SE SE 7-13n-4w, in the White Valley area, Box Elder County, Utah, which is now reported drilling below 1,100 ft. This wildcat is scheduled as a 4,500-ft. test.

Completions.—Twenty-four wells were completed, with 16 in Wyoming, 2 in Colorado, 4 in Montana, and 1 each in Utah and northern New Mexico. Four wildcat failures were drilled in Wyoming, two in Colorado, and one each in Montana and Utah. In northern New Mexico Stanolind temporarily completed a noncommercial gas discovery in the Rosa area. The well was drilled to 8,087 ft. in the Morrison and was plugged back for completion as a small gas well in the Dakota. Additional testing of gas shows in the Pictured Cliff formation may be done by the operator at a later date.

WILDCAT FAILURES IN WYOMING

Greybull area, Big Horn County: Oriental Refining 1 Fee, NE NE SE 21-52n-93w (NE Lot 3), 3,08 ft. TD, plugged and abd., Dakota 970 ft., Morrison 1,510 ft., Chugwater 1,960 ft., Dinwoody 2,650 ft., Embar 2,700 ft., Tensleep 2,970 ft., Amsden 3,090 ft., Madison 3,170 ft.

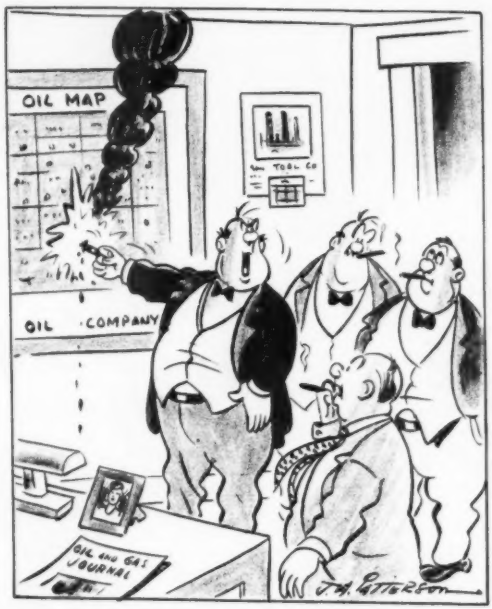
Sage Creek, Big Horn County: Western Oil Syndicate 1 Fee, SE SE NW 20-57n-97w, 3,822 ft. TD, plugged and abd., first Frontier 879 ft., second Frontier 1,170 ft., Mowry 1,210 ft., Muddy 1,990 ft., Dakota 2,160 ft., Morrison 2,370 ft., Sundance 2,780 ft., Gypsum Springs 3,290 ft., Chugwater 3,325 (?) ft.

Walters Dome, Big Horn County: Conrad E. Bales et al 1 Govt., SW NE NW 14-50n-90w, 1,587 ft., plugged and abd., Chugwater 340 ft., Tensleep 1,585 ft.

Left Creek, Crook County: Starr Oil Co. 1 W. F. Anderson II, NW SE SE 5-53n-66w, 1,533 ft. TD, plugged and abnd., Minnelusa 940 ft.

WILDCAT FAILURES IN COLORADO

Dry Mountain, Moffatt County: British-American Oil 1 Govt., NW NW NW



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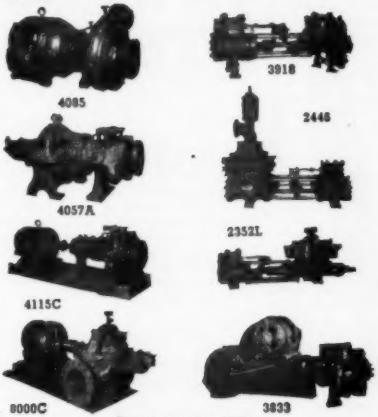

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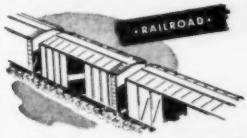

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29-9n-99w, 6,346 ft., TD, plugged and abdn., Fort Union 5,604 ft.

Fort Moran, Morgan County: Murphy et al 1 Mowery, C NW SE 6-2n-56w, 6,0001 ft. TD, plugged and abnd., Niobrara 4,604 ft., Timpas 4,897 ft., Muddy 5,364 ft., Dakota 5,436 ft., Lakota 5,740 ft.

WILDCAT FAILURE IN MONTANA

Acme area, Teton County: British-American Oil Prod. Co. 1 Swenson, SE NE SE 7-24n-2w, 3,652 ft. TD, PB 1,724 ft., plugged and abnd., Black leay 393 (?) ft., first Red shale (Kootenai (?) 1,35 ft., Madison 1,700 ft., Devonian 2,850 ft., Cambrian 3,644 (?) ft.

WILDCAT FAILURE IN UTAH

Teasdale, Wayne County: Pacific Western Oil Corp. 1 Unit, NW NW NE 17-30s-6e, 4,932 ft. TD, plugged and abnd., Kaibab 154 ft., Coconino 292 ft., Hermosa 1,542 ft., Leadville 3,316 ft., Devonian 4,910 (?) ft.

WILDCAT SUCCESS IN NORTHERN NEW MEXICO

Rosa Unit, Rio Arriba County: Stanolind Oil & Gas 1 Unit, C SW SE 11-31n-6w, 8,087 ft. TD, PB 8,050 ft., comp. for 560,000 cu. ft. gas per day through $^{3}/_{8}$-in. choke, Animas 855 ft., Ojo Alamo 2,402 ft., Kurtland 2,520 ft., Pictured Cliff 3,330 ft., Lewis shale 3,460 ft., Cliffhouse 5,350 (?) ft., Menefee 5,450 (?) ft., Point Lookout 5,575 (?) ft., Mancos 5,658 (?) ft., Dakota 7,865 ft., Morrison 8,055 ft.

EASTERN TEXAS

Lakeview Paluxy Field Gets Confirmation Well

DALLAS.—Confirmation well for the Lakeview Paluxy sand field of Franklin County, 10 miles north of Mount Vernon, was completed last week at B. G. Byars and R. L. Peveto 1 House, SP Survey, northeast offset to the discovery. The well made a pumping potential of 147 bbl. of oil a day from pay at 4,417-20 ft. The field's two wells have been given a daily allowable of 100 bbl.

The same operators staked location for 2 Tulley, 330 ft. from north and west lines of a 43-acre tract, same survey, as an east offset to the discovery, and south of the 1 House. Surface pipe had been set and drilling started at last report.

Dan Jefferson Drilling Co. 1 M. L. Edwards, $1^{1}/_{2}$ miles northeast of the above wells, was reported dry at 4,425 ft. Top of the Paluxy was not revealed.

In Wood County, additional sub-Clarksville production has been opened by Shell Oil Co., Inc., 1 Consumers Lignite Co., Friend McMahan Survey. The well pumped 10 bbl. of oil a day through perforations from 4,153-70 ft. Location is 2 miles south of Alba.

Magnolia Petroleum Co. 1 Cartwright, east outpost to the Cotton Valley gas-distillate discovery in Lassater field of northwestern Marion County, recovered 170 ft. of mud cut with gas on a drill-stem test in the lower Travis Peak sand at 8,800-82 ft. Length of test was not reported. Drilling continued below 8,910 ft., which was thought to be about 300 ft. above the Cotton Valley.

In Titus County, 6 miles east of Talco, W. B. Hinton 1 Belcher, Bowen Survey, reported first anhydrite stringer at 5,122 ft. Drilling continued below 5,390 ft.

In Sabine County, Humble Oil & Refining Co. 1-B J. W. Minton, Shadrich Morris Survey, A-42, was coring below 8,084 ft. in lime. Humble 1-F Pickering, Huxley field Travis Peak test, was coring shale and lime at 7,070 ft.

Delta Drilling Co. 1 J. M. Haddad, William Price Survey, A-766, in Red Springs field of Smith County, had total depth at 9,541 ft. and prepared to make drill-stem test. Perforations were made in casing at 9,266-92 and 9,348-69 ft. Humble 1 A. E. Forston, William Price Survey, A-766, of the same area, was drilling shale at 9,966 ft. Cores recovered $1^{1}/_{2}$ ft. of lime with light gas odor and 1 ft. of slightly porous siltstone with light odor and stain, between 9,865-88 ft. Miles Producing Co. 1 D. Crews heirs, I. T. Simms Survey, A-920, $4^{1}/_{2}$ miles northeast of Dindale, was drilling lime at 6,933 ft., on an 8,000-ft. Paluxy contract.

EAST TEXAS (DISTRICTS 5, 6 AND 6-P) WILDCAT FAILURES

Franklin County: Dan Lester Drilling Co. 1 W. M. McCarty Sur., 9 mi. N Mt. Vernon, $1^{1}/_{4}$ mi. NE Byars & Peveto 1 Tally, dry, TD 4,430 ft.

Hopkins County: W. B. Hinton 1 W. J. Hooten, U. Aiguir Sur., 10 mi. N Sulphur Springs, dry, TD 5,565 ft., electric log 5,466 ft., Austin 2,947 ft., sub-Clarksville 2,993 ft., Woodbine 3,425 ft., Georgetown 4,365 ft., Goodland 5,376 ft., Paluxy 5,440 ft., elev. 488 ft.

Limestone County: Wm. W. Leach 1 First National Bank of Mt. Calm, C. Sullivan Sur., $1^{1}/_{2}$ mi. SW Mt. Calm, dry, TD 1,485 ft.

Upshur County: M. H. Harrell 1 J. H. Vessell est., J. B. B. Davenport Sur., 6 mi. SW Gilmer, dry, TD 1,280 ft.

Wood County: J. M. Dupree and F. R. Jackson 1 G. T. Turner, David Gilleland Sur., A-229, 2 mi. SE Pine Mills, dry, TD 5,624 ft., Pecan 2,986 ft., Austin 4,584-4,752 ft., sub-Clarksville 4,787 ft., side-wall cores in Woodbine at 5,606-15 ft. had oil shows.

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CANADIAN FIELDS

Texaco-McColl Frontenac Gets Alberta Production

CALGARY.—The Texaco Exploration Co.-McColl Frontenac Oil Co. team has obtained its first Alberta oil production. The team received its initial production at Redwater, where it recently purchased four quarter-section tracts of Crown land for a cash bonus of $1,872,000. First well on the tract, Texaco-McColl-Redwater 11-10, LSD 11, 10-58-22w4, was completed at 3,255 ft., acidized with 2,000 gal. and placed on production test. During 3 hours on open flow it averaged around 60 bbl. hourly, indicating a daily rate of 1,440 bbl.

The Texaco-McColl team has drilled 14 wildcats in Alberta since 1947, all of which have failed to find commercial production. Of this total four were drilled during this year. The team also has a stake in six additional wildcats that have been drilled this year. Its new Redwater oil comes as a long-sought-for gain after carrying out extensive exploratory work in the province.

A team of three Calgary independent oil firms has placed its second Leduc oil success on steady production. This is the third venture for McDougal Segur Exploration Co., Alberta Pacific Consolidated Oils and Sunset Oils, Ltd., each with a one-third interest in the operations. The first well at Leduc, on the west edge of the field, was a failure.

The new producer, McConset Leduc 3, LSD 15, 34-49-26w4, ½ mile west of the team's initial success, is in the southeasterly portion of the field, offsetting Home Oil Co. production. The well, completed in D3 at 5,402 ft., was jet perforated and then swabbed into production. During a 12-hour open-flow test it rated 1,300 bbl. daily.

Canadian Gulf Oil Co. has temporarily shut in its dual zone Devonian oil discovery well at Stettler after running a series of production tests. The well, Gulf-Ellis 1, LSD 4, 10-38-20w4, is now waiting production setup prior to being placed on steady yield. Completed at 5,385 ft., Ellis showed 50 ft. of productive porosity and an equivalent oil zone in D3 Devonian. Tests run at the well indicated a potential of around 3,000 bbl. daily (combined D2 and D3 zones).

The Parker Drilling Co. rig from Ellis has been moved about 2 miles south to Gulf-Bauer 4, LSD 34-37-20w4, where crew is currently making hole below 4,740 ft., heading for its Devonian objectives.

Another gas discovery was chalked up at South Brazeau 4 wildcat located in LSD 2, 36-31-14w4, in the Hanna area, about 100 miles northeast of Calgary. During drill-stem test of interval 3,679 to 3,749 ft., in the Basal Cretaceous, believed to be equivalent to the Sunburst sand section, the well flowed natural gas at an estimated rate of 20,000,000 cu. ft. daily. During the short test the well blew gas almost immediately, but pipe recovery was negligible. Crew struck the chert beds around 3,760 ft., and is continuing coring at 3,872 ft.

Canadian Gulf Oil Co. has capped its Walter Marr 1 well, at Pincher Creek, and will hold it as such until a market is available for its product. The well, located in LSD 1, 29-4-29w4, was drilled to 12,768 ft., and during test of its Madison limestone horizon produced natural gas at the rate of 83,000,000 cu. ft. daily, accompanied by a 3,000-bbl. daily flow of distillate measuring 52.5° A.P.I. Meanwhile, the Gulf-Fred Shrempp 1, located in LSD 4, 35-3-29w4, down flank in structure, is bottomed at 12,068 ft., near top of the Madison and crew is running intermediate string of protective casing around 5,500 ft.

CANADIAN WILDCAT FAILURES

Bear-Villa 1, LSD 7, 8-74-145w4, TD 6,526 ft.
Hudson's Bay-Winnifred 1, LSD 11, 6-12-9w4, TD 4,800 ft.

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North Goldsmith Field Gets Good Extension

MIDLAND.—General American Oil Co. 1 C. F. Scharbauer-Penn 40, SE SE 29-44-T1N-T&P, extended upper Clear Fork production in the North Goldsmith area of Ector County 1 mile northeast of Texas Pacific Coal & Oil Co. 33 Scharbauer, discovery well. The new extension had top of pay at 5,496 ft., and completed for a flowing potential at 251 bbl. of 35°-gravity oil in 24 hours, plus some water, through ¾-in. choke. Casing was perforated at 5,496-5,543 ft. and 5,565-5,616 ft. and treated with 9,000 gal. of acid. Flowing pressures were not reported. Gas-oil ratio was 1,725 cu. ft. According to field sources, the area may be called North Goldsmith 5,400-ft. pool.

Upton County.—Humble Oil & Refining Co. 1 First National Bank of San Angelo, SE SE 5-Y-GC&SF, extended Fusselman production ⅜ mile to the northwest, with a completion potential of 333½ bbl. of 55°-gravity oil a day, flowing through 14/64-in. choke. Tentative top of the Fusselman was placed at 11,405 ft. Elevation was 2,700 ft. First perforations were from 11,450-85 ft., with 100 shots. The well would not flow, and the holes were squeezed. After reperforating at 11,405-85 ft., the well was swabbed, then kicked off and tanked 54 bbl. of oil in 11 hours before being treated. Total depth was 11,495 ft.

Republic Natural Gas Co. 1 Powell, 44-40-T4S-TP, northern Upton County wildcat, was pulling the tester after running a drill-stem test at 12,295-12,400 ft. in the Fusselman section. The packer failed in 17 minutes and results were not satisfactory. Location is 2 miles south of the Pegasus field, Magnolia Petroleum Co. 1-36 Glass had reached 11,673 ft. in the Devonian and was drilling ahead.

Midland County.—Northeast of the Pegasus discovery, Magnolia 2-30 Glass ran a 2-hour drill-stem test in the Devonian at 11,696-11,758 ft. Gas showed at the top in 1½ hours, and recovery was 90 ft. of heavily gas-cut drilling mud, with no shows of oil or water. Open flowing bottom-hole pressure was 125 psi., increasing to 1,400 psi. after shut in 15 minutes. It was drilling ahead below 11,778 ft.

Gaines County.—Samedan Oil Corp. et al 1-EA Andrews, Ellenburger test in the Robertson area, ran a 2-hour and 15-minute drill-stem test at 7,095-7,185 ft. in the lower Clear Fork zone. Gas came to the surface in 21 minutes and produced a strong blow throughout the test. Recovery in the pipe was 3,420 ft. of fluid, being 2,640 ft. of oil (which unloaded after 12 stands of dry pipe had been pulled) 90 ft. of clean oil, and 690 ft. of sulfur water. Open flowing bottom-hole pressure ranged from 800-1,250 psi. Shut-in pressure in 15 minutes was 2,700 psi. Operators drilled ahead following the test. The section tested was believed to be lower in the Permian than the field's pays.

Scurry County.—At last week's statewide hearing in Mineral Wells, the Texas Railroad Commission was asked to reduce discovery allowables in the North Snyder area, bringing that area in line with other reef producing fields in the county. The new order, not yet signed by the commissioners at this report, would cut back from 350 bbl. to 140 bbl. of oil a day per well.

W. A. Moncrief et al 1 C. W. Huckabee, 160-3-H&GN Survey, 1½-mile southeast extension for North Snyder field, flowed 539 bbl. of 43.5°-gravity oil in 12 hours, through ½-in. choke, on completion test and rated a daily potential of 1,078 bbl. Production was from open hole at 6,680-6,800 ft. Flowing pressures were 200 psi. on tubing and 675 psi. on casing. Gas-oil ratio was 845 cu. ft.

Gene Goff 1 Fred C. Ohlenbusch, 1½ miles northeast of production in the Kelly area, Section 38, Kirkland & Fields Subdivision, showed gas in 9 minutes, mud in 40 and oil in 45 minutes, on a 50-minute drill-stem test from 6,790-6,801 ft. The well flowed into pits through ⅝-in. bottom choke, at an estimated rate of 75 bbl. of oil an hour. Casing was run to 6,776 ft. for completion tests. Top of the reef was 6,767 ft., and top of pay at 6,782 ft., on an elevation of 2,391 ft. Corrected total depth was 6,801 ft.

Thomas W. Doswell, Hery Ford 11, et al 1 C. W. Addison, ¾-mile west extension to Sharon Ridge Canyon field, in NE SE 122-25-H&TC, was delayed in completion to install a blowout preventor. On a test of open hole from 6,642-76 ft., total depth, the well kicked off and flowed after being washed with water. It made an unestimated flow into pits and recovered 4,800 ft. of oil and gas-cut mud, and 2,000 ft. of free oil, in 15 minutes. Top of pay at 6,636 ft. was said to be 62 ft. higher than the nearest producer.

Standard Oil Co. of Texas 5-2 Brown, Section 440, reported a recovery of 120 ft. of oil and gas-cut mud on a 2-hour drill-stem test at 7,930-59 ft., which was believed to be in the Ellenburger. It was drilling ahead. Location is a north offset to the field's discovery, in NE NW of the section.

WEST TEXAS (DISTRICTS 8 AND 7-C) WILDCAT FAILURES

Howard County: C. L. Norsworthy 1 Mary Christian (formerly Santa Fe Petroleum Corp.), SE SW 48-32-2n-T&P, 9 mi. NE Big Spring, old TD 4,162 ft. in lime, new TD 8,321 ft., dry, Sprayberry sand 5,805 ft., Wolfcamp 6,850 ft., elev. 2,632 ft., DST 6,027-6,130 ft. open 1 hr., recovered 570 ft. slightly gas-cut salty mud.

Menard County: United North & South Development Co. 1 W. J. Wilkinson, Blk. 28, T&NO Sur., 11 mi. NW Menard, dry, TD 3,559 ft. in dolomite, Strawn 2,780 ft., Bend 3,110 ft., Ellenburger 3,295 ft., elev. 2,310 ft., 2-hr. DST in Marble Falls 3,160-3,214 ft., gas in 14 minutes, recovered 380 ft. of heavily oil and gas-cut mud, flowing pressure 350 psi., acid-

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ized and swabbed 72 hr., recovered light gas and 1-2 gal. of free oil an hour.

Val Verde County: O. W. Killiam 1 Walter Babb (formerly Patrick Bros.), 104-2-I&GN, 3 mi. E Middleton, NW corner of county, dry, TD 3,075 ft., Cretaceous 740 ft., Pennsylvanian 2,700 ft., Wolfcamp 1,475 ft., elev. 1,559 ft., had fresh water at TD, reported shows of oil and gas at 2,019-25, 2,047-57 and 2,080-86 ft.

SOUTHEASTERN NEW MEXICO

HOBBS. — Magnolia Petroleum Co. 1-B Santa Fe, NE SE 28-9s-36e, opened Pennsylvanian limestone pay in Crossroads field of northeast Lea County. Initial potential, on the pump, was 175 bbl. of 47 -gravity oil, and 136 bbl. of water a day, from pay at 9,750-75 ft. Gas-oil ratio was 450 cu. ft. Total depth was 9,888 ft., plugged back to 9,775 ft.

In northeast Chaves County, Apache Oil Corp., of Houston, and others 1 Nobles Trust, approximately NE SW 18-4s-27e, 40 miles northeast of Roswell, reported shows of distillate in limestone at 6,205-99 ft. A 2-hour drill-stem test of that interval had gas, estimated at 3,750,000 cu. ft. daily, at the surface in 3 minutes. Drilling mud came to the surface in 20 minutes, and flowed an unestimated amount, according to some reports. Recovery included 30 ft. of distillate, and 30 ft. of distillate-cut drilling mud. Open flowing pressure ranged from 300-735 psi. The section being tested is thought to be a lower Pennsylvanian limestone.

SOUTHEAST NEW MEXICO WILDCAT FAILURE

Eddy County: Barney Cockburn 1 State, 6-18s-28e, 1 mi. S production in Red Lake field, dry, TD 2,095 ft., shot 2,025-50 ft., bailed 1 bbl. oil a day.

CALIFORNIA

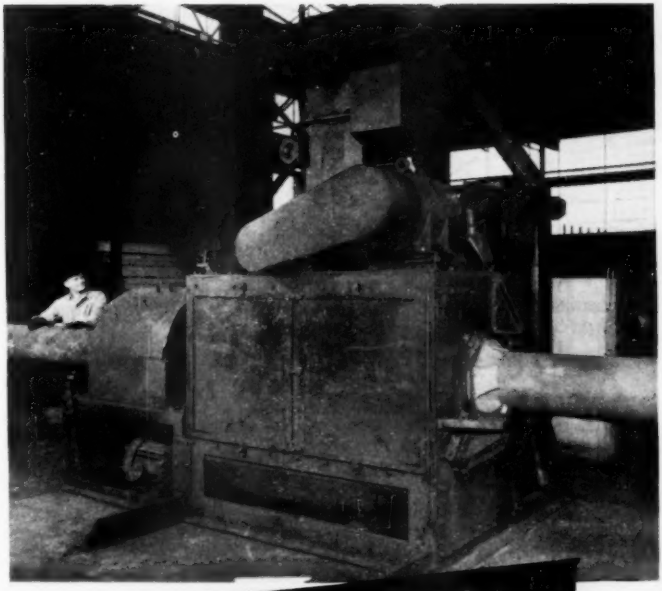
Wildcat Interest Centers In Cuyama Valley Area

LOS ANGELES.—With continued unfavorable reports coming in from the Carrizo Plains tests, the center of wildcat interest is again the Cuyama Valley region. Eight tests are now under way with plans for at least three more. The ninth test in the area, C. W. Colgrove 82-16 Stone, 16-11n-28w, was abandoned at 1,804 ft. after topping Cretaceous at 1,580 ft. At the extreme southeast end of the valley, operations are still suspended in Bolsa Chica's 1 Hickey, at 6,819 ft. About 7 miles west of this site, in Section 17-9n-25w, Richfield Oil Corp. is drilling and spot coring beyond 6,098 ft. at the B-1 Wegis-Reyes. To the west of present production and west of the San Andreas fault, there is little activity. In 16-10n-28w, W. R. Gerard 48-16 Gerard-Callaway has been idle for some time at 5,022 ft. Greatest interest is to the east where five tests are active. Richfield 1 Russell "C," 4-10n-26w, is the farthest location east. The site is 7½ miles from Russell Ranch production. The well was spudded August 18 and is now below 600 ft.

A small extension for South Cuyama field may result from Richfield 45-31 F. K. Perkins. Top of oil sand was reached at 4,196 ft. Present depth is below 4,601 ft. with coring in progress.

With two completions in the recently discovered Calder field, General Petroleum Corp. now has two more development wells under way. These are 36-23 Calder-KCL, drilling in shale below 6,071 ft., and 74-24 Calder KCL, drilling below 9,841 ft. In this last well the bit topped Stevens sand around 8,000 ft. and is now in hard shale.

Standard Oil Co. of California 4-2 S F & L F test is dry at 12,954 ft., after nearly 2 years of continuous activity. The site is in



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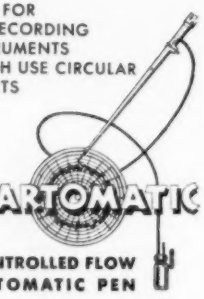

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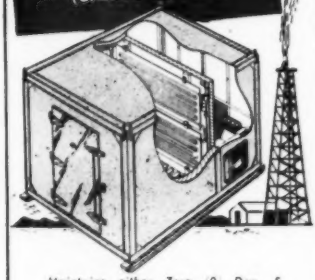

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the South Dome area of Kettleman Hills, 12-25s-19e. The hole flow 400 bbl. of salt water from an interval near 8,000 ft.

Continued formation tests on what might be the world's deepest producing well remain unimpressive. Gassy mud and water with a scum of oil is all that has been found so far. The well is Standard Oil 5 Mushrush in Wasco field. The next interval for testing is 11,440-75 ft.

CALIFORNIA SUCCESSFUL WILDCAT

Kern County, Edison area: H.K.O. Oil Co. 1 H.K.O., 35-30s-29e, 2½ mi. S Edison production, pumping 5 bbl. of 19°-gravity oil per day, TD 3,172 ft., PB 3,050 ft., elev. 564 ft.

CALIFORNIA WILDCAT FAILURES

Kern County, Ant Hills area: Maurer & Fischer 5 Linda, 11-29s-29e, dry, top Olcese 720 ft., TD 1,500 ft., elev. 560 ft.

Jasmine area: L. C. Gould et al 16-1 Richardson, 16-25s-27e, dry, TD 3,162 ft., elev. 629 ft.

McVan area: General Drilling Co. C-6 Fitzhugh USL, 14-27s-27e, dry, top Pyramid Hills 2,695 ft., top Vedder 2,810 ft., top lower Vedder 3,060 ft., TD 3,434 ft., elev. 931 ft.

Kings County, Devils Den area: Signal Oil & Gas Co. 36-1 Signal-Jack, 36-24s-17e, dry, TD 1,480 ft. in Cretaceous, elev. 735 ft.

Los Angeles County, Newhall area: Standard Oil Co. 5-3 N L & F, 34-4n-16w, dry, TD 7,792 ft., elev. 1,252 ft.

Puente area: Richfield Oil Corp. 1 R. M. Petitfils, 10-2s-10w, dry, TD 1,551 ft., elev. 430 ft.

Whittier area: E. T. Willard 1 Lawrence est., 29-2s-10w, dry, TD 3,006 ft., elev. 910 ft.

San Luis Obispo County, Cuyama area: C. W. Colgrove 82-16 Stone, 16-11n-28w, dry, top Cretaceous 1,580 ft., TD 1,804 ft., elev. unknown.

Santa Cruz County, Bean Hill area: Union Oil Co. 2 Loma Prieta, 20-10s-1e, dry, TD 4,570 ft., elev. 1,350 ft.

Tehama County, Flournoy area: Marker Foundation, Inc., 2 Marker, 28-25n-5w, dry, TD 780 ft., elev. 710 ft.

Ventura County, Somis area: General Petroleum Corp. 1 Las Posas-McBean, 34-3n-20w, dry, TD 9,235 ft., elev. 623 ft.

LA.-ARK.

New James Lime Pay in North Stevens Field

SHREVEPORT—H. T. Pannell 1 Bannister, SE SE NE 1-15s-20w, opened a new pay in the James line in North Stevens field, Nevada County, when it completed on the pump for 240 bbl. of 28°-gravity oil a day, plus 5 per cent water. Total depth was 4,013 ft., with perforations at 2,932-38 ft. The well entered the Lower Cretaceous at 2,720 ft., on an elevation of 319 ft. Top of the James lime section was not reported.

Arkansas exploration reports included the following wells: In Bradley County, 6 miles northeast of Vicks, A. J. Slagter 1 Hayward, 2-16s-9w, was dry in the Smackover at 4,710 ft. It had stuck drill pipe and had encountered salt water.

Morris et al 1 J. D. McClurkin, 10-16s-19w, Columbia County, was drilling in the lower Glen Rose at 3,688 ft. It is a new operation, scheduled to 4,000 ft.

E. L. Pinkston 1 Knighton, 15-15s-23w, Lafayette County, was drilling in Cotton Valley at 5,747 ft. It is a 6,500-ft. Smackover wildcat, located on subsurface and seismograph prospect.

Plains Production Co. 1 B. Striklin, 33-14s-27w, was drilling Travis Peak formation at 4,710 ft. Contract depth is 6,200 ft. Location is 5 miles northeast of Texarkana, in Miller County. Herman C. Taylor 1 Dickerman, 8-17s-28w, shallow Nacatoch test, was preparing to core in the Arkadelphia at 1,176 ft.

Catahoula Parish.—Carter Oil Co. 1-B Louisiana Central Lumber Co., 4-9n-6e, was shut down for orders at 5,611 ft., in the Midway. Cores at 4,561-4,604 ft. recovered 21 ft. of salt water sand and 11 ft. of shale. Side-wall cores at 3,104-5,505 ft. had no shows. Top of the Wilcox was 2,982 ft.

Claiborne Parish.—Haynes B. Ownby Drilling Co. 1 Malone, 36-21n-6w, was drilling below 5,640 ft. in the lower Glen Rose.

DeSoto Parish.—E. C. Laster 1 Grimes, 26-15n-14w, had total depth at 5,290 ft. and stopped to run electrical surveys. Perforations in the Rodessa at 5,159-94 ft. were treated with 5,000 gal. but tested dry. With plug at 5,150 ft. and new perforations from 5,131-36 ft., the well flowed water and gas. No estimate was made on the volume.

Lincoln Parish.—Southwest Gas Producing Co. 1 J. L. Liggin, 9-20n-2w, was drilling at 7,572 ft., in the Travis Peak, with no shows reported to date.

Tensas Parish.—Peterson Drilling Co. 1 H. C. McKinney, new Wilcox test in NW SW 11-13n-10e, was drilling ahead at 5,540 ft. Sample top on the Wilcox was 2,846 ft.

Union Parish.—M cCain & Holloway 1 Holloway, 15-23n-1w, had total depth at 2,255 ft., in the Nacatoch, and was waiting for orders. Cores at 2,240-55 ft. recovered shaly sand with light oil shows. First drill-stem test of the interval failed due to mechanical troubles.

NORTH LOUISIANA WILDCAT FAILURES

LaSalle Parish: Dan L. Reynolds 1 D. J. Critchett, SE NW 32-11n-3e, dry, TD 3,344 ft., no shows.

Natchitoches Parish: Continental Oil Co. 1 Bastrop State Bank, NE SE NE 18-10n-6w, dry, TD 9,019 ft., Wilcox 384 ft., Midway 2,020 ft., Arkadelphia 2,774 ft., Saratoga 2,878 ft., Tokio 3,420 ft., Austin 4,172-4,430 ft., Tuscaloosa sand 4,779 ft., lower Cretaceous 4,901 ft., James 7,909 ft., Sligo 8,348 ft., elev. 166 ft.

Tensas Parish: Union Oil Co. of California 1 Weatherly-Anderson, SE SW 38-12n-12e, dry, TD 8,818 ft., Wilcox 3,246 ft., Midway 6,065 ft., Arkadelphia 6,995 ft., Tuscaloosa 7,970 ft., Massive sand 8,791-8,812 ft., top 8 ft. had gas, bottom 12 ft. showed oil, perforated 8,487-92 ft., flowed 11 bbl. salt water per hour, elev. 83 ft.

ARKANSAS WILDCAT FAILURE

Miller County: H. B. Brown 1 E. W. Hilburn, NE SW SW 8-17s-26w, dry, TD 4,008 ft., electric log, 4,020 ft. by driller, base annona 2,650-70 ft., elev. 294 ft.

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OHIO, KENTUCKY

Sayre Pool Extended East by Half Mile

COLUMBUS.—The Ohio Fuel Gas Co. 2 A. G. Rodgers, Section 14, Bearfield Township, Perry County, a ½-mile extension to the north part of Sayre pool, topped the Medina sand at 3,950 ft. and was drilled to 3,956 ft. with 618,000 cu. ft. natural and 1,540,000 cu. ft. when tubed and shut in after shot. The Clinton at 3,848-93 ft. was dry.

Frank Morrow et al found 558,000 cu. ft. of gas in the Newburg on 2 R. E. Melick, Section 2, Jackson Township, Knox County, a well that was headed for the Clinton. The sand was topped at 2,437 ft. and drilled to 2,452 ft.

Allen Willey brought in another producer at Frazeysburg on 2 John Lewis, Lot 6, Jackson Township, Muskingum County. Clinton sand at 3,135-3,208 ft. had a good fill up natural and 50 bbl. in 24 hours after shot.

Ditch & Gerig 1 Geo. Ramsier, Section 18, Congress Township, Wayne County, reached the Newburg at 2,644 ft. and finished at 2,704 ft. with 831,000 cu. ft. which will be tubed natural.

Another First Berea well was completed in Lodi Township, Athens County, by Pittsburgh Gas Co. on 2 Ida Williams in Section 19. Sand, topped at 1,420 ft., was drilled to 1,429 ft. with an open flow of 759,000 cu. ft. natural.

Locations are still running ahead of completions with 29 from 14 counties for the week. Monroe County had six and Noble, Perry, and Ashland three each. Ashland field led in completions with 9 out of a total of 26.

OHIO WILDCAT FAILURE

Medina County, Litchfield Township: Roy Stewart 1 Cora Speith, Lot 51, no Clinton, TD 3,013 ft.

WESTERN KENTUCKY

OWENSBORO.—The area 2 miles east of the Uniontown pool and about 3 miles west of the Robinson pool, in Union County, has been established as another important producing area for western Kentucky. The discovery well, Delta Drilling Co. 1 Walker heirs, NW SE NE 13-P-20, has been completed pumping 364 bbl. of clean oil daily from O'Hara lime at 2,512-23 ft. In the meantime, I. W. Hartman and associates 1 Culver heirs, 11-P-20, another prospective pool opener 1½ miles to the east, is being put on the pump after favorable swabbing tests of both the O'Hara and Cypress. From the O'Hara at 2,513-21 ft. and 2,527-36 ft. it swabbed 101 bbl. of clean oil in the first 6 hours and 84 bbl. in the next 24 hours, as previously reported. Since then, it swabbed 20 bbl. per day from the Cypress sand at 2,302-10 ft. Pumping tests will take in both zones. Closeness of the two wildcats and the fact that they have a common pay zone in the O'Hara lime at approximately the same depth may indicate they are tapping a single large pool.

I. W. Hartman and Calvert-Willis, Inc., 1 Meredith, 11-P-18, a wildcat on the east side of Wabash Lsland, in the Ohio River, about 4 miles west of Uniontown, Union County, is preparing to complete in Cypress sand, where, in a previously reported drill-stem test, it got a substantial flow of gas and recovered 210 ft. of clean oil and 120 ft. of mud-cut oil. The test took in an interval at 2,305-45 ft. In deepening the hole, additional showings were encountered in Cypress down to 2,380 ft. Hole was carried to 2,797 ft., where tests of the Aux Vases at 2,590-2,606 ft. and the McClosky at 2,650-2,797 ft., proved disappointing, and now has been plugged back to 2,345 ft. with 5½-in. casing run to 2,410 ft.

George S. Engle and J. E. McCauley 1 Greathouse, SW cor. 23-Q-20, first confirmation test for the new Cypress sand pool recently opened by Ryan Oil Co. and George & Wrather 2½ miles southeast of the Powells Lake pool, Union County, has been completed making 180 bbl. of clean oil daily on the pump. It is an east offset to the discovery well. Sand is at 2,234-41 ft. as compared with 2,243-51 ft. in the discovery well.

A. Teller 1 Martin, 13-N-28, a half mile northwest extension to the Glenville pool, Daviess County, pumped 20 bbl. daily at completion in Bethel sand at 1,643-44½ ft.

WESTERN KENTUCKY SUCCESSFUL WILDCAT

Union County: Delta Drilling Co. 1 John Walker Estate, SE NW NE 13-P-20, IP 370 bbl., Lower O'Hara 2,512-23 ft., TD 2,526 ft. (Discovery well Caney Mound East pool).

WESTERN KENTUCKY WILDCAT FAILURES

Hancock County: Cumberland Petroleum Co. 1 Dunlevy, NE NW SW 10-P-33, dry, TD 633 ft.

Snowden & McSweeney 1 Rice & Nugent, NE SE NE 5-P-33, dry, TD 811 ft.

Henderson County: George S. Engle 1 Alves, NE NW SE 18-Q-21, dry, TD 2,740 ft.

INDIANA

EVANSVILLE.—Opening a new producing area in Vanderburgh County, Ryan & Sharp are putting their 1 Schweikart, NE NE NW 15-5s-11w, on the pump for final testing. The well, which flowed by heads in initial tests following a 2,000-gal. acid treatment in O'Hara lime at 2,536-42 ft., is about 6 miles northwest of Evansville. Nearest production is about 2 miles to the northeast in the small Darmstadt pool. In a drill-stem test of the pay prior to running casing, the well had a recovery of 1,922 ft. of clean oil.

A possible half-mile southwest extension of the Stacer pool, 3 miles northeast of the Darmstadt pool, in the same county, is indicated at George E. Baldwin 1 Boyle, NW NW SE 32-4s-10w, which filled 1,600 ft. with fluid after perforating casing in the O'Hara at 2,245-50 ft. The hole, drilled to 2,350 ft., has been standing as temporarily abandoned since the early part of the year.

Evans & Dobbs and Lewis & Sons 1 A. C. Brown, NE NW NE 28-2s-11w, which is opening a new producing area about 2 miles to the east of the North Owensville pool, in Gibson County, is being put on the pump for completion after swabbing at the rate of 5 bbl. per hour from Benoist sand at 2,112-34 ft. It is estimated good for about 100 bbl. daily.

The Union-Bowman pool in Pike County got an exceptionally good well, one of the best on record for the entire state, at Wabash Petroleum Corp. 1 Houghlan, NE NW NE 31-1n-9w. Testing Rosiclare lime at 1,655-61 ft. with bottom of hole at 1,667 ft., it started flowing at the rate of 60 bbl. an hour and had to be shut in at intervals for additional tankage. The flow followed a 2,000-gal. acid treatment of the pay. Operators estimate the well as good for about 1,400 bbl. per day on regular production.

INDIANA SUCCESSFUL WILDCAT

Marshall County: C. W. Kendall 1 D. & V. Kares, SW SW SW 12-34n-2e, IP 800,000 cu. ft. gas, Pennsylvanian 357-60 ft., TD 360 ft. (Discovery well Lake of the Woods pool).

INDIANA WILDCAT FAILURES

Fountain County: Warren Graver 1 Kirkpatrick, SE NE NE 4-20n-6w, dry, TD 808 ft.

Knox County: Ernest Zink 1 J. R. Charley, SE NE SW 9-5n-9w, dry, TD 880 ft.

Sullivan County: Ryan & Sharp 1 Kixmiller, SE SE SE 26-6n-8w, dry, TD 2,447 ft.

New Building Started

HOUSTON.—Construction work has begun in New Orleans on the new 10-story building to house The California Co. The structure is to be owned and operated by General Enterprises, Inc., and will be ready for occupancy in October 1950.

ILLINOIS

Five New Pools Opened In Illinois Exploration

MATTOON.—Establishing a new producing area about 2 miles southwest of the New Harmony South pool and about the same distance east of the North Maunie pool, Hayes Drilling Co. 1 Brown, SE NW NW 29-5s-14w, White County, has been completed as a 75-bbl. pumper. Pay zone is the Aux Vases sand at 3,003-13 ft. Bottom of the hole is 3,043 ft., plugged back from 3,133 ft. Casing is at 2,998 ft.

Another new area in the same county is that opened by C. E. Brehm in his 1 Dagley, NE SW NE 2-7s-9e, east of the Herald pool, which has been completed as a 40-bbl. pumper in Cypress sand at 2,855-80 ft. However, the same operator's 1-A Bagley, a 10-acre location east, apparently has limited production in that direction. The latter had showings in the same sand at 2,685-91 ft., but these were not sufficient to make a well.

Southwest of the Omaha pool in Gallatin County, Carter Oil Co. 1 Hughes, SE SE NE 8-8s-8e, pumped 20 bbl. of oil with 50 bbl. of water at completion in the Aux Vases, in which casing was perforated at 2,716-22 ft. It marks a substantial extension, or new pool.

In the same county, 1½ miles northeast of the North Junction pool, Oil Management Co. and Hayes Drilling Co. 1 Max Wilson, NE NE NW 2-9s-9e, has been completed on the pump for 98 bbl. per day from a Pennsylvanian sand at 1,600-14 ft.

National Associated Oil Co. and Continental Oil Co. 1 Cockcroft, NW NW SW 1-12n-11w, rank wildcat about 7 miles southeast of Paris, in southeastern Edgar County, continues to swab about 13 bbl. per day in testing McClosky lime with casing perforated at 969-73 ft. and 978-82 ft.

ILLINOIS SUCCESSFUL WILDCATS

Gallatin County: Carter Oil Co. 1 C. L. Hughes, SE SE NE 8-8s-10e, IP 20 bbl., Aux Vases 2,717-22 ft., TD 2,936 ft. (Extension Inman East pool).

Jasper County: Baldwin & Graham 1 H. James, SW SW SW 27-6n-14w, IP 29 bbl., McClosky 2,682-90 ft., TD 2,725 ft. (Extension Ste. Marie pool).

Wabash County: Oil Management Co. and Hayes Drilling Co. 1 Woods, NE NE SE 31-1n-13w, IP 20 bbl., Lower O'Hara 2,787-92 ft., TD 2,889 ft. (Extension Maud North Consolidated pool).

ILLINOIS WILDCAT FAILURES

Christian County: Dell Carroll et al., 1 Walter Kepner, SE SE SE 5-13n-1e, TD 2,401 ft.

Clark County: John Lewald 1 Jeffers, SE SE SW 31-11n-13w, dry, TD 585 ft.

Hamilton County: The Texas Co. 1 Hull, SE SW SW 3-7s-6e, dry, TD 3,375 ft.

Jasper County: Keystone Oil Co. 1 Ball, NW SW NW 9-7n-9e, dry, TD 3,010 ft.

Madison County: H. A. Lange Drilling Co. 1 Engelke, NE NE NW 31-6n-6w, dry, TD 580 ft.

Moultrie County: E. A. Obering et al., 1 R. C. Coffey, SW SE SE 20-14n-4e, dry, TD 2,840 ft.

Richland County: H. Runyon 1 M. Runyon, NE NW SW 30-3n-10e, dry, TD 3,200 ft.

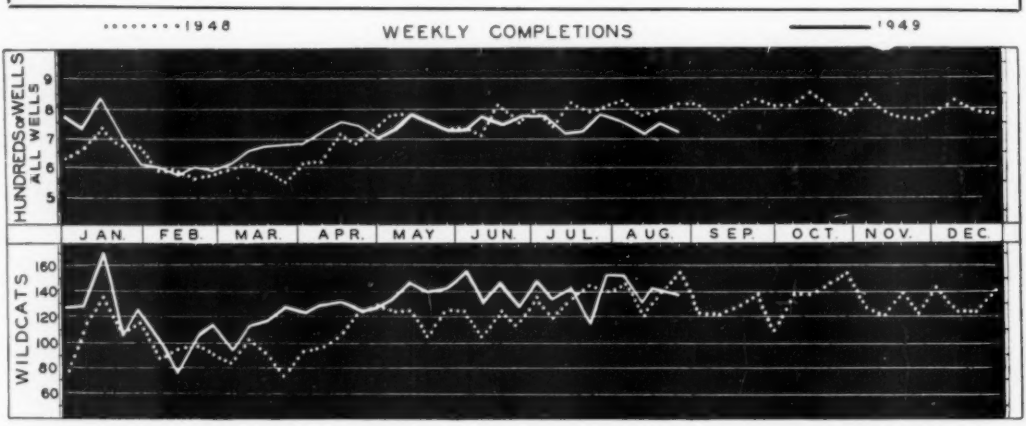
Schuyler County: Coyle Petroleum Co. 1 Walker, SW NW SE 9-2n-2w, dry, TD 676 ft.

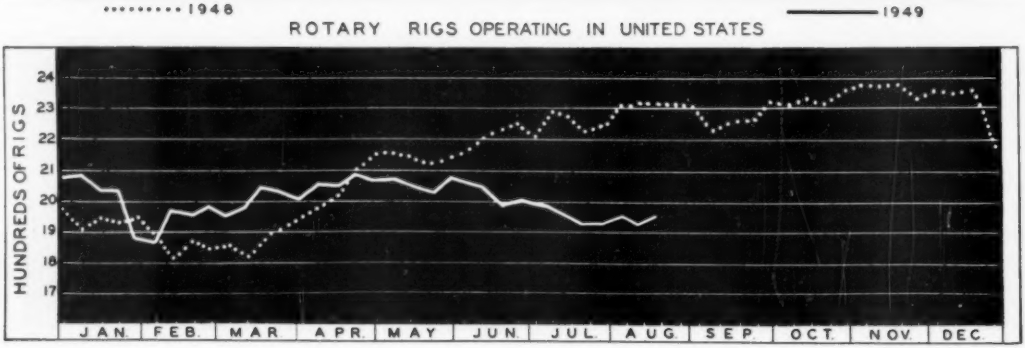
St. Clair County: R. L. Grossman 1 Freidrick, SE NW NW 31-1s-9w, dry, TD 1,070 ft.

WEEKLY WELL COMPLETIONS . . . WEEK ENDED AUGUST 27, 1949

	Total of all wells					34 wk.		Wildcat completions and discoveries					Cumulative total, 1949				
	Comp.	Oil	Gas	Dry	Footage	1949	1948	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	12	6	0	*6	13,882	657	979	0	0	0	0	0	0	0	0	0	0
Pennsylvania	24	5	8	†11	48,568	968	1,672	0	0	1	0	1	0	0	4	1	5
West Virginia	8	2	6	0	21,982	314	516	0	0	0	0	0	1	0	7	7	15
Ohio	26	7	8	‡11	49,560	684	877	0	0	0	1	1	1	0	2	24	27
Indiana	20	8	3	9	25,061	833	668	0	0	1	3	4	23	0	1	153	177
Kentucky	15	5	0	10	22,172	573	443	1	0	0	3	4	18	0	0	47	65
Illinois	48	27	0	21	119,754	1,622	1,485	3	0	0	9	12	41	0	1	276	318
Michigan	15	6	0	§9	31,273	624	516	0	0	0	2	2	20	0	1	189	210
Kansas	66	42	6	18	216,595	2,050	1,948	2	0	0	7	9	46	0	5	257	308
Neb., Mo., Iowa	0	0	0	0	0	16	5	0	0	0	0	0	1	0	0	11	12
Oklahoma	72	39	4	29	268,564	2,771	2,621	1	0	0	14	15	97	11	10	411	529
Texas	256	158	12	86	1,016,561	8,622	7,490	8	1	1	46	56	273	34	81	1,484	1,872
North Central (Dist. 7-B & 9)	100	65	0	35	268,759	2,883	2,346	6	0	0	15	21	127	0	11	583	721
West (Dist. 7-C & 9)	59	54	0	5	293,455	2,063	2,030	0	0	0	3	3	36	0	3	167	206
Panhandle (Dist. 10)	14	10	4	0	41,469	647	386	0	0	0	0	0	1	0	0	5	6
Eastern (Dist. 5, 6, & 6-P)	11	2	0	*9	47,931	427	343	0	0	0	5	5	7	2	3	92	104
Gulf Coast (Dist. 2 & 3)	43	21	4	18	243,457	1,310	1,196	2	1	1	10	14	57	26	36	261	380
Southwest (Dist. 1 & 4)	29	6	4	19	121,490	1,292	1,189	0	0	0	13	13	45	6	28	376	455
Louisiana	56	34	4	18	290,876	1,434	1,427	1	0	0	4	5	38	15	4	135	190
Northern	39	23	4	12	134,155	821	940	0	0	0	3	3	3	2	0	61	66
Southern	17	11	0	6	156,721	613	487	1	0	0	1	2	35	11	4	74	124
Arkansas	7	2	0	5	42,050	204	183	0	0	0	1	1	3	0	0	42	45
Mississippi	13	6	0	7	84,527	228	260	0	0	0	3	3	4	0	1	68	73
Southeastern States	2	0	0	2	9,437	34	35	0	0	0	2	2	1	0	0	29	30
Montana	4	1	1	2	11,964	160	175	0	0	0	1	1	3	0	2	22	27
Wyoming	16	8	0	8	67,788	395	342	0	0	0	4	4	18	0	0	72	90
Colorado-Utah	3	0	0	3	17,279	89	156	0	0	0	3	3	2	0	0	36	38
New Mexico	13	9	2	2	66,086	334	388	0	0	1	1	2	9	0	2	33	44
California	41	30	0	11	208,708	1,699	1,861	1	0	0	11	12	27	0	6	298	331
Total United States	717	395	54	268	2,632,687	24,311	24,047	17	1	4	115	137	626	58	127	3,595	4,406
Total previous week	752	390	69	293	2,609,039	23,594	23,232	17	1	2	121	141	609	57	123	3,480	4,269
Total August 28, 1948	815	442	73	300	2,964,683			25	3	9	119	156	573	53	176	3,180	3,982

Service wells included: *6, †9, ‡1, §4, ¶2. Revised.





DAILY AVERAGE PRODUCTION FOR WEEK

	Aug. 27 crude oil	B. of M. Aug. demand	Aug. 20 crude oil
Alabama	1,200	1,350	1,100
Arkansas	73,150	88,000	73,250
California	899,300	928,000	899,800
Colorado	67,600	66,000	65,500
Eastern	60,000	60,850	58,600
Florida	1,600	1,400	1,575
Illinois	184,100	176,000	180,300
Indiana	26,600	26,000	27,200
Kansas	256,300	302,000	265,350
Kentucky	22,900	21,000	22,700
Louisiana	482,700	520,000	483,000
North Louisiana	113,400		113,700
South Louisiana	369,300		369,300
Michigan	46,900	46,000	43,850
Mississippi	100,850	109,000	98,550
Montana	27,100	24,000	26,500
Nebraska	500	700	500
New Mexico	125,075	131,000	125,075
Oklahoma	378,300	410,000	379,400
Texas	1,838,200	2,150,000	1,838,200
Dist. 1 (Southwest)	25,740		25,740
Dist. 2 (Southwest)	112,000		112,000
Dist. 4 (Southwest)	177,600		177,600
Dist. 3 (Gulf Coast)	338,860		338,860
Dist. 5 (Eastern)	32,100		32,100
Dist. 6 (Eastern)	79,000		79,000
East Texas field	222,400		222,400
Dist. 7-C (West)	42,300		42,300
Dist. 8 (West)	519,100		519,100
Dist. 7-B (W. Central)	57,600		57,600
Dist. 9 (N. Central)	137,300		137,300
Dist. 10 (Panhandle)	94,200		94,200
Utah	1,300	700	1,200
Wyoming	126,800	130,000	129,700
Total United States	*4,720,475	5,180,000	4,721,350
Change from previous week, down	875		
Canada	65,280		62,985

Total U. S. production January 1-August 27 †1,214,937,490 bbl.
Same period last year (crude plus cond.) 1,315,153,720 bbl.

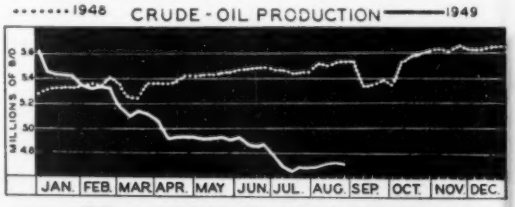
*Not including 80,145 bbl. condensate. †Including 19,735,390 bbl. condensate.

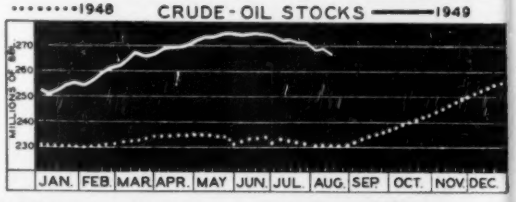
CRUDE-OIL STOCKS BY STATES OF ORIGIN*

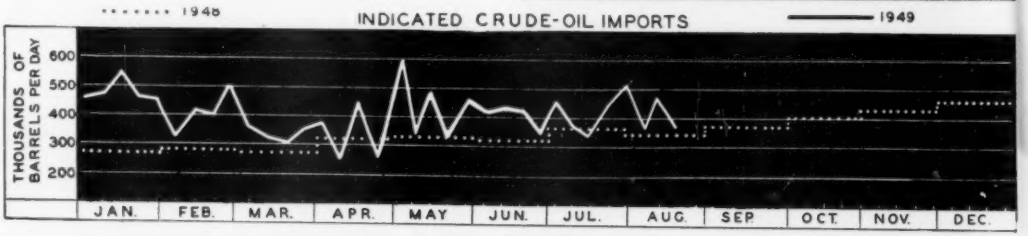
(Thousands of barrels)

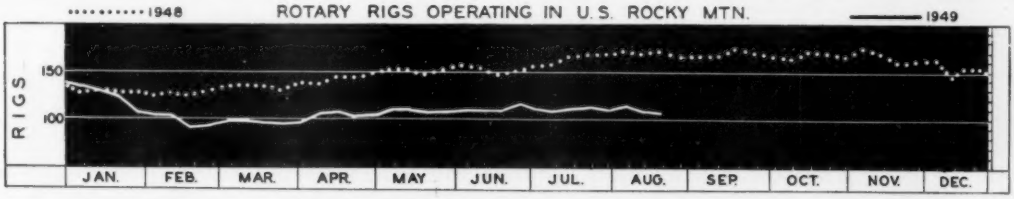
	Aug. 20, 1949	Aug. 13, 1949	Aug. 14, 1948
Pennsylvania Grade	3,409	3,318	2,805
Other Appalachian	2,025	2,102	1,073
Ill., Ind., Mich.	13,514	13,993	11,099
Arkansas	2,977	2,945	2,764
Louisiana	14,829	15,614	11,557
North	3,683	3,824	2,997
Gulf	11,146	11,790	8,560
Mississippi	2,794	2,926	2,831
New Mexico	7,782	7,522	6,008
Oklahoma and Kansas	39,282	39,736	34,255
Texas	123,372	122,988	111,853
East Texas	16,345	16,146	15,703
West Texas	49,491	49,638	41,821
Texas Gulf	30,025	28,955	28,836
Other Texas	27,511	28,249	25,493
Rocky Mountain	14,143	14,264	9,352
California	35,290	35,551	30,102
Foreign	7,038	7,771	5,633
Total United States	266,455	268,730	229,332

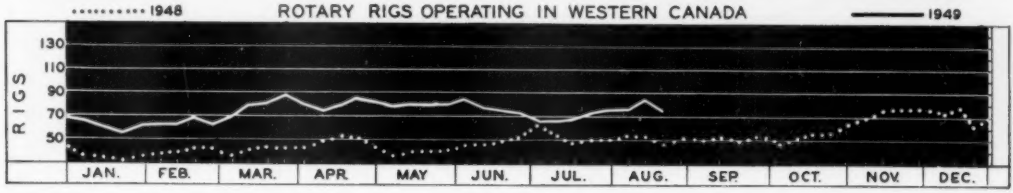
*Bureau of Mines











Refining Statistics

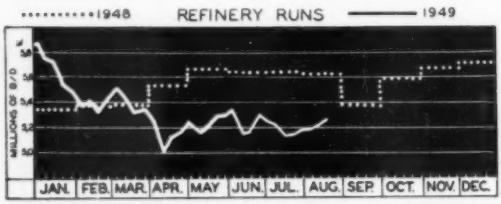
A.P.I. REFINERY REPORT, AUGUST 20

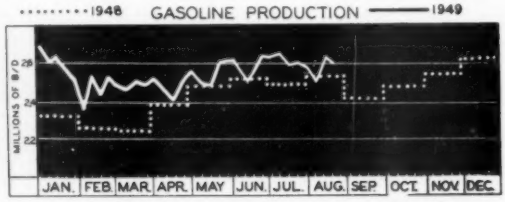
(Thousands of barrels)

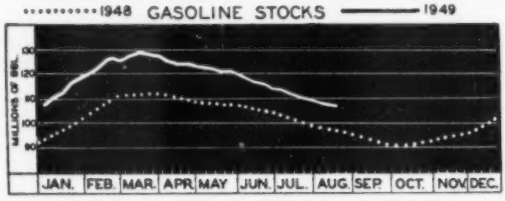
District	Daily avg. crude runs	Daily average production: Gasoline*	Kerosine	Distillate	Residual	Stocks at refineries, bulk terminals, in transit and in pipe lines: Gasoline†	Kerosine	Distillate	Residual
East Coast	755	315.6	26.7	143.7	177.4	24,438	10,594	22,991	9,836
Appalachian:									
District 1	87	34.9	5.0	6.7	8.6	2,367	433	674	516
District 2	67	36.4	3.4	5.1	18.3	1,152	156	253	221
Ind., Ill., Ky.	850	494.7	40.9	118.4	127.7	23,324	5,118	12,164	4,709
Okla., Kans., Mo.	424	237.4	17.7	74.9	63.7	9,387	1,756	5,947	2,119
Inland Texas	218	152.3	9.3	21.4	43.9	3,843	706	1,043	1,442
Texas Gulf Coast	1,274	618.9	71.0	220.9	242.1	15,911	3,013	12,023	7,572
La. Gulf Coast	417	223.1	39.0	97.6	55.0	5,506	2,308	4,094	2,107
N. La. and Ark.	83	31.1	5.6	12.1	15.1	2,621	606	934	330
Rocky Mountain:									
New Mexico	10	6.4		1.9	2.9	93	25	95	30
Other Rocky Mtn.	189	82.6	8.1	35.6	36.4	2,430	392	1,811	668
California	867	365.9	6.7	124.8	279.7	16,540	715	13,283	38,607
August 20, 1949	5,241	2,599.3	233.4	863.1	1,070.9	107,612	25,822	75,312	68,157
August 13, 1949	5,227	2,626.2	197.6	817.7	1,040.3	108,174	25,329	73,815	67,818
August 21, 1948	5,648	2,534.6	284.0	1,038.4	1,288.6	95,132	22,382	59,086	52,172

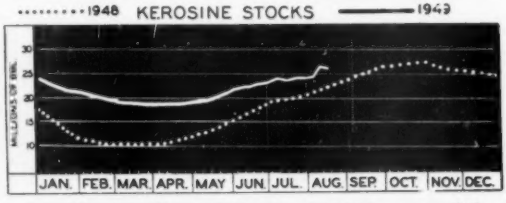
Bureau of Mines, August 1948	Daily avg. crude runs	Daily average production: Gasoline*	Kerosine	Distillate	Residual
	868	326.6	41.4	177.9	215.0
	95	42.2	3.7	10.9	9.8
	28	12.5	1.2	4.7	9.5
	914	477.9	49.7	139.2	155.2
	486	245.6	19.3	95.3	76.5
	245	148.2	11.3	26.3	62.1
	1,412	608.4	96.3	306.5	262.3
	434	189.5	45.3	100.6	78.8
	80	30.2	7.5	13.2	17.9
	14	7.1	0.5	2.0	4.0
	158	70.7	3.8	27.9	34.1
	887	373.3	16.1	133.9	322.3
	5,621	2,532.2	296.1	1,038.4	1,247.5

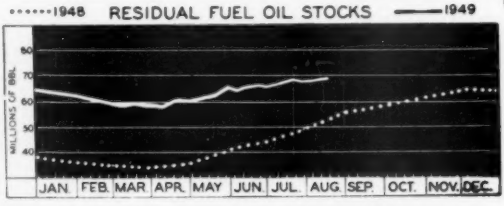
*At refineries including natural blended. †Finished and unfinished.

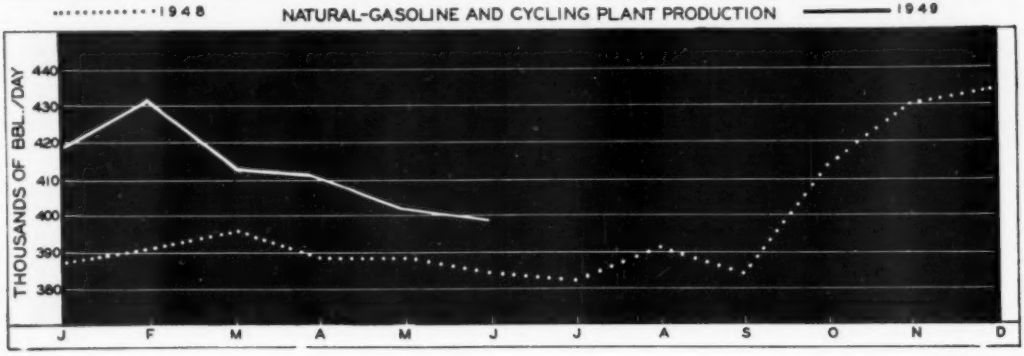












CRUDE PRICES GRAVITY SCHEDULE

Gravity—	Signal Hill, Calif.	Oklahoma, Kansas	Gulf Coast Tex.*	West Tex.†
18-18.9	$1.78			
19-19.9	1.85			
20-20.9	1.93	$2.25		$2.12
21-21.9	2.00	2.27		2.14
22-22.9	2.07	2.29		2.16
23-23.9	2.13	2.31		2.18
24-24.9	2.20	2.33	$2.56	2.20
25-25.9	2.26	2.35	2.58	2.22
26-26.9	2.31	2.37	2.60	2.24
27-27.9	2.37	2.39	2.62	2.26
28-28.9	2.42	2.41	2.64	2.28
29-29.9	2.48	2.43	2.66	2.30
30-30.9	2.54	2.45	2.68	2.32
31-31.9	2.59	2.47	2.70	2.34
32-32.9	2.64	2.49	2.72	2.36
33-33.9		2.51	2.74	2.38
34-34.9		2.53	2.76	2.40
35-35.9		2.55	2.78	2.42
36-36.9		2.57	2.80	2.44
37-37.9		2.59	2.82	2.46
38-38.9		2.61	2.84	2.48
39-39.9		2.63	2.86	2.50
40 and above		2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point.

†Includes Lea County, New Mexico. Last general price change represented a 50-cent increase becoming effective December 6, 1947. Above changes do not include recent reductions of a few buyers applying principally to low-gravity grades.

FLAT CRUDE PRICES

Representative posted schedules per barrel.	
East Texas†	$2.65
Kettleman Hills, California*	2.77
Beauregard Parish	2.60
Illinois Basin	2.77
Pecos County, Texas (Yates)	2.35
Bradford, Pennsylvania	3.40
Eastern Ill. and Western Ind.†	2.77
Tomball, Texas Gulf Coast	2.83

*37°-37.9°. †35° and above.

DISTILLATE heating oil demand on the East Coast appears to be stronger with prices firm. Increased movement to the high-demand areas is reflected in a firmer market on the Gulf Coast.

Esso Standard Oil Co. established a new price of 7 cents per gallon for No. 2 distillate fuel in cargo lots at Gulf Coast ports. The new increase, effective August 29, amounts to .375 cent per gallon and follows a .25-cent raise announced for August 15.

The general firming of the distillate market over the past few weeks seems to indicate that fuel prices have passed the summer low point and that resellers and consumers are beginning to think about their fuel needs for the winter. These needs can be met if heavy movement to the user starts within the next few weeks.

The most important development in the heavy fuel market is the report that 4,000,000 bbl. of residual fuel will be shipped from a California refiner to the New York area. The fuel will be delivered in New York below the $1.70 current harbor price, despite a tanker charge of more than 60 cents per barrel. It was said the California seller arranged the deal as an apparent alternative to reducing runs in its West Coast plants because of the fuel-oil surplus there.

Residual stocks on the West Coast amounted to 38,607,000 bbl. on August 20. This represents a gain of 18,433,000 bbl. or 91 per cent over stocks at the end of August last year. Residual inventories in the combined Gulf-East Coast area were 19,515,000 bbl. on August 20 or about 3,000,000 bbl. less than at the end of August 1948.

REPRESENTATIVE QUOTATIONS

Representative spot-market quotations of leading suppliers as of August 29, 1949. Figures are f.o.b. plant for tank-car shipment in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor (barge)	Tex. Gulf Coast
Regular gasoline, 73-75 octane	9½-10	11.5	9½-10
Premium gasoline, 78-80 octane	10½-11	12.5	10½-11
42-44 w.w. kerosine	7¾-8¼	7.75-8.4	7⅞-8⅛
No. 2 straw fuel oil	6⅛-6¾	6.8-8	6⅝-7
No. 6 residual	$0.85-0.90	$1.70	$1.35-$1.45

NATURAL GASOLINE

	Group 3	North Texas	N. La
Grade 26-70	5½	5	5¼
Grade 18-55	6.6	6	6.3

LUBRICATING OILS
South Texas

200 vis., No. 2-3 neutral	10.5
750 vis., No. 3-4 neutral	13
2,000 No. 5-6 neutral	14-15

LUBRICATING OILS
Mid-Continent

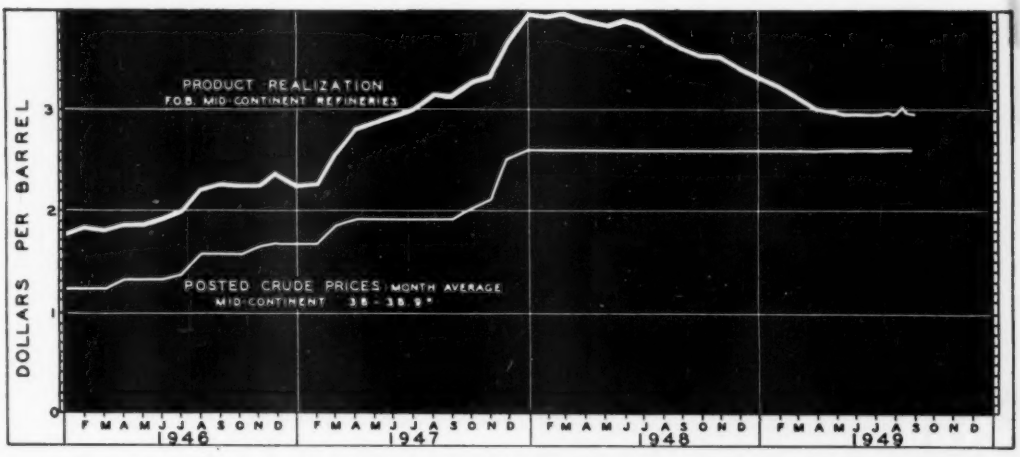
150-160 vis., D bright stock, 0-10 pp	19
200 vis., No. 3 neutral, 0-10 pp.	12-14

Western Pennsylvania

144-155 vis., 10 p.t. bright stock	19.5
180 vis., 0 p.t. neutral	20.5

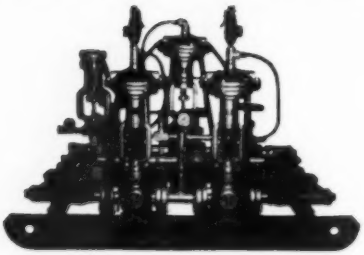
CRUDE-SCALE WAX
Mid-Continent

132-134 A.M.P.	4.5



In this trend chart refinery realization is based on average Mid-Continent grade crude oil (not 38° gravity only) and average prices for refinery products as published in The Oil and Gas Journal basis Oklahoma (Group 3). Refinery yields confined to gasoline, kerosine, distillate, and fuel oil

NEW PECO
FIRING CONTROL



CUTS BOILER COSTS 3 WAYS!

1. SAVES GAS —

New automatic PECO Firing Control eliminates wasteful pop-offs and wide fluctuations in steam pressure . . . gives you constant steam pressure for faster trips and more hole drilled per cu. ft. of gas used.

2. SAVES LABOR —

Automatic design eliminates hand firing—reduces manhours required and relieves fireman for other vital work.

3. SAVES MAINTENANCE —

PECO Controls cut boiler expansion and contraction—reduce gas burner wear. Synchronized stack blower regulator protects stack from excessive deterioration. In addition, PECO's special regulator-exchange service and quick-call service by expert service engineers assure proper equipment operation and long trouble-free service.

Increase your boiler efficiency today. *Drill more feet per hour with PECO-controlled power!*

FREE — Write for your copy of PECO's new folder that gives complete information about the firing control system that pays for itself.

PECO PRESSURE ENGINEERING CO.
Gulf Building Addition, Houston 2, Texas
EXCLUSIVE DISTRIBUTORS CHAS. M. BAILEY
PRESSURE REGULATORS & STEAM SPECIALTIES

NOR-BRO-LOY

SWAGED NIPPLES

Norris Brothers' metallurgists developed an alloy steel that was just right. In this application, they engineered the steel for the job it must do.

Constant experiment, constant scientific investigation make possible these masterpieces of metallurgy. Infinite care in production results in a uniformly excellent product. Together, these factors have built a reputation for progress in alloy steel development for a specific purpose.

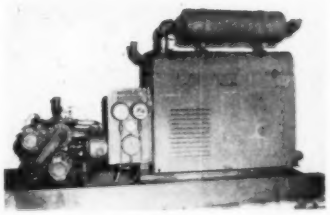
These swaged nipples are made in sizes from ¼-inch to 1½-inch inclusive.

Norris Brothers, INC.
ROBINSON · ILLINOIS

BYRON-JACKSON "P.U.P." TWO STAGE PUMPING UNITS FOR GASOLINE—CRUDE—WATER

Price: $1,250.00 each, F.O.B. Houston, Texas. Subject to prior sale.

Surplus — New. Crated for Export with parts and tools.



This unit consists of one 3 inch 2-stage Byron-Jackson "PUP" Pickup Centrifugal Pump—3 inch Suction and discharge, 4 inch Adapters for couplings, 200 BPH at 680-feet head or in parallel 400 BPH at 340 feet head, direct connected to Chrysler Model C-36 (Ind.-9)—Industrial 8-cylinder Engine, Skid Mounted. Wt. 4060 lbs. Skid length 9 feet 6 inches. Height 62 inches. Width 29 inches.

MAXIMUM PUMP EFFICIENCY-FLUID WATER

	RPM	PSI	GPM
Parallel Hook-UP	1800	105	480
	2200	155	590
	2400	185	650
Series Hook-UP	1800	210	240
	2200	305	295
	2400	360	325

Complete with electric starter, generator, battery, etc. Ideal for Salt Water Disposal Wells. Excellent Fire Pumps.

HALLORAN Equipment Co.
431 Kress Building HOUSTON 2, TEXAS Phone CApital 1447

EQUIPMENT MEN ... in the News

Dennis to Head Weldment Sales for Graver Tank

Graver Tank & Manufacturing Co., Inc., East Chicago, Ind., has announced the appointment of Harry A. Dennis as manager of sales of the Weldment Division in the Midwestern area.

Dennis was formerly with Lukens Steel Co. and its byproducts and Lukenweld divisions as assistant district manager of sales.

Starting in 1939 with Lukens as a helper in the open hearth, Dennis later became a welding research engineer and for several years did welding service engineering work.

United Centrifugal Names Davey Engineering as Agent

KINGSLEY DAVEY

Davey Engineering Sales Co., St. Louis, has been appointed to represent United Centrifugal Pumps in that territory, according to a recent announcement.

Kingsley Davey, head of the St. Louis firm, is a registered professional engineer of the state of Missouri. Prior to his establishment of the present St. Louis organization, he served as a pump design engineer for Darling Brothers Brothers of Montreal, Canada. During World War II he was project engineer for Monsanto Chemical Co.

United Centrifugal Pumps is a division of United Iron Works. For the past 30 years it has specialized in pumps for pipe-line, refinery, and processing applications.

Adel Appoints Miller and Stumm Vice Presidents

W. A. DeRidder, president of Adel Precision Products Corp., Burbank, Calif., and Huntington, W. Va., has announced the election by the board of directors of Fred T. Miller and R. A. Stumm, Jr., as vice presidents of the firm.

Miller, previously the firm's general sales manager, has been appointed vice president in charge of engineering and sales at the Burbank division, while Stumm, previously assistant to the president, has been appointed vice president in charge of manufacturing of the Burbank division.

Miller has been associated with Abel for 8 years, and prior to his present position was the firm's general sales manager. In this capacity he supervised sales and engineering service of Adel aircraft, marine, and industrial products.

Stumm joined Adel in December 1946 as purchasing agent. From 1948 to the present time he has served as assistant to the president. Prior to joining Adel, he was purchasing agent for Earl M. Jorgensen Co.

Martin Transferred to Mt. Pleasant by Franklin

Franklin Supply Co., Chicago, has announced the transfer of Stanley Martin, vice president, to Mt. Pleasant, Mich., to handle company operations in Michigan and Ohio.

Kenneth Goodell has been appointed district manager and transferred to East Chicago, Ind. Roy Wood, vice president, will now be located in Chicago handling company sales throughout the Chicago metropolitan area.

Dew-Card to Handle Web Wilson Oil Equipment

Fred S. Dewel and Cecil Cardinal, coowners of Dew-Card Oilfield Specialty Co., of Casper, Wyo., are the Rocky Mountain distributors for Web Wilson Oil Tools. They have the complete line of Web Wilson Oil Tools at their disposal.

Kerotest Appoints Frame Works Manager

W. M. FRAME

Stanley J. Roush, president, Kerotest Manufacturing Co., has announced the appointment of W. M. Frame as works manager in charge of all engineering and manufacturing operations.

Frame was formerly works manager for Spang-Chalfant division of National Supply Co.

Pickens Joins Dearborn In Pipe-Line Department

Dearborn Chemical Co., manufacturers of No-Ox-Id rust preventives and No-Ox-Idized wrappers, has announced the addition of W. E. Pickens to their pipe-line department as a service engineer.

Pickens has had wide experience in the application of rust preventives to pipe lines, having served in a supervisory capacity for such organizations as Sinclair Oil Co., Williams Brothers Corp., Oklahoma Contracting Co., El Paso Natural Gas Co., and G. G. Griffis Construction Co.

Pickens will make his headquarters in Dearborn's Chicago office but will devote his time exclusively to field work assisting and advising construction projects applying No-Ox-Id coatings.

(Continued on page 121)

Baash-Ross Opens New Oklahoma City Plant and Offices

Baash-Ross Tool Co. has recently opened this new plant and offices in Oklahoma City. The new plant, occupying the same site as the old plant established 20 years ago, contains 20,000 sq. ft. of floor space in addition to a storage yard equipped with a 5-ton overhead traveling crane

Classified Advertising

The Market Place for the Oil Industry

UNDISPLAYED

All ads, 12 cents a word. Minimum charge, $3.00 per insertion.
Centered Line, any ad, $1.00.
Box Numbers count 9 words when replies are to be sent to our Tulsa Office. Replies forwarded without charge.

DISPLAYED, PER INCH

$12.00 per column inch per insertion. One-point border and 12-point capitals are allowed. Larger type sizes not accepted.

All classified advertising payable in advance.
10% Discount if 3 insertions are ordered at one time.
COPY DEADLINE, 9:00 a.m. Monday prior to each week's issue.

THE OIL AND GAS JOURNAL
P. O. Box 1260, TULSA, OKLAHOMA

EQUIPMENT FOR SALE

FOR CABLE TOOLS
DEGEN PIPE AND SUPPLY CO.
Box 107, Red Fork Station, Tulsa, Oklahoma

FOR SALE: Mayhew Shot Hole Drilling Rig mounted on 1947 Ford truck. 550 gallon water tank mounted on 1947 Ford truck. Complete with all equipment, in good condition, ready to move on job. Bargain. F. W. Brown, Box 607 or Phone 400, Britton, Oklahoma.

CARDWELL RL SPUDDER. Completely equipped. Good operating condition. Located Central Oklahoma. For prices and terms write: Barnes Drilling Company, 22 West Fourth St., Tulsa, Oklahoma.

EQUIPMENT FOR SALE

FOR SALE: Two Fairbanks-Morse Diesel Engines, 150 H.P. Twin Cylinder, Horizontal Type. Completely overhauled. $1500.00 each. Melton Supply Co., Seminole, Okla.

FOR SALE: Failing Model 1500 Heavy Duty Rotary drilling rig, equipped with 4½" x 6" mud pump, mounted on 1948 International KB6 truck, complete with drill pipe, subs, tools, etc. Also 800 gallon custom built water tank, equipped with vacuum lift, mounted on 1948 International KB6 truck. All equipment in excellent condition. Address: Box D-168, The Oil and Gas Journal, Tulsa, Okla.

FOR SALE: 2, complete Wilson Mogul skidtype spudders, with double pole mast costing $3200, powered by 165 hp. GAKU Waukesha motors, good condition, F.O.B. Cars, price $4,000 each, Model 121, Serial No. 3760. One Wilson Mogul Spudder, with mast, less engine, $2,250. 1—145 H.P. Young Drilling engine, complete, A1 condition guaranteed, gas-gasoline, $2,250.00. 1—Riise 110 H.P. Drilling engine, natural gas, $2,000. 1—Clark 2 cy. 70 H.P. with 6 cy. starting engine, $350. One Caterpillar 60—gasoline-gas engine, with jack shaft and clutch, flat belt drive, $650.00. 25 Pumping engines, South Penn 20 H.P. $125; 20 H.P. Reids and 22½ H.P. Bessemers $150 to $200 each. 100 Pumping and drilling belts for sale. McGinnis, Tri State Oil and Gas Co., Box 827, Parkersburg, W. Va.

NEW 6⅝" O.D. API LINE PIPE

Seventy-three (73) Miles New 6⅝" O.D. 13# API Electric Weld Line Pipe, Plain End. Beveled for Welding, Regular Mill Coating, double random length Van Dyke Protectors Applied. Rock Island Oil & Refining Co., Inc., 335 West Lewis Street, Wichita, Kans. Telephone 7-3325.

EQUIPMENT FOR SALE

USED Franks Well Servicing Unit, super East Texas model, 7 x 8 x 62-foot pole mast, good condition. Box D-165, The Oil and Gas Journal, Tulsa, Oklahoma.

ROTARY Rig complete, 87 foot telescope mast, Wilson mogul drawworks with 145 h.p. GAK Waukesha motor, 2 5x8 Oil Well mud pumps with 285 h.p. Waukesha motors, doghouse, light plant, approximately 4,000 feet 4½ inch drill pipe. 1 1949 KB-8 International truck with 28 foot Hobbs float, 1 1948 2 ton Chevrolet truck with 22 foot float. Rig now drilling 6 miles west of Davis, Oklahoma. 2 drilling contracts 2100 ft. and 3300 ft. goes with rig if desired. Price $45,000.00; terms if desired, $20,000.00 down, $2,000 per month thereafter. Sanders Oil Company, Call 710 Shawnee, Oklahoma, or 18F2 Pearson, Oklahoma.

BULLDOZERS: 1 D6 Caterpillar new $9,000, 1 D6 Caterpillar less than year old $7,000, 1 TD14 International less than year old $6,500, 1 TD14 International recently overhauled $3,750, 1 TD9 International recently overhauled $2,750. Motor graders: #8 American recently overhauled $2,500, #51 Adams recently overhauled $3,000. 1 60 C.F.M. Chicago Pneumatic compressor with hammer, hose and bits, used very little, $1,000. Western Construction Co., Phone 3241 or 5571, San Angelo, Texas.

PIPE LINE PUMPS. Two 3-stage Byron Jackson Centrifugal pumps, direct connected to 400 H.P., 1750 RPM three-phase 60-cycle Westinghouse Motors, unitized on steel base and complete with electric controls. Each pump can deliver between 25,000 and 27,000 barrels crude per day at 350 pounds, or in series between 40,000 and 43,000 barrels at 750 pounds. These units are in good condition. Included are a number of spare parts. Call or write C. G. McLaren, Shell Oil Co., Tulsa, Oklahoma.

FOUR Lufkin single crank #31 C pumping units, complete with 30 H.P. General Electric motors. Full particulars, Wiegand Bros., Milam Bldg., San Antonio, Texas.

FOR SALE: Cardwell Rotary Rig, complete with Mast. Suitable for 3,500 ft. drilling. Bargain. Terms. Melton Supply Co., Seminole, Okla.

FOR SALE: CARDWELL Model R double drum draw works manufactured 1946, in good condition, price $9,000.00. Box D-155, The Oil and Gas Journal, Tulsa, Oklahoma.

FACTORY OVERHAULED—DRILLING OR PIPE LINE ENGINE

Model RX1SV Le Roi 12-cylinder, 6¾" Bore x 7" Stroke, 3006 cu. in. displacement. Complete with Radiator, Starting Engine, Clutch and all latest accessories. Full-size crankshaft. Operated approximately 1,000 hours since complete overhaul and modernizing at factory service shop. Price $4,000.00.

LUCEY PRODUCTS CORPORATION
624 S. Cheyenne — TULSA, OKLA. — Phone: LD204

FOR SALE
OFFSHORE SEISMOGRAPH FLEET

Bids are invited for the following equipment which includes all boats, Shoran surveying equipment, and radio equipment required for offshore seismic exploration. At present based at Freeport, Texas, and can be inspected by appointment.

BOATS

2—62'-4" Diesel twin screw steel recording boats built to order by Higgins
2—45'-9½" Diesel twin screw "Eureka" boats for Shoran base stations
1—37' gasoline single screw wooden "Eureka" boat
1—45' steel utility barge
1—16' Higgins skiff with outboard motor.

SHORAN EQUIPMENT

Complete Shoran surveying equipment for three mobile stations and three base stations.

RADIO EQUIPMENT

7—Kaar series 46Y radio transmitters (50 watt).
7—Kaar series 25EY radio receivers.
6—Premax antennas.
4—Kaar 642A power supply (110 v AC)
5—Kaar D24Y direction finder receivers.
1—Set Halliburton wire line surveying equipment
Miscellaneous radio and Shoran test equipment.

ALSO

1—110' converted Sub-chaser Diesel twin screw wooden recording boat complete with necessary radio equipment at present based at Morgan City, Louisiana.

Write Box D-143, THE OIL AND GAS JOURNAL, Tulsa, Okla.

COMBINED VAPOR SEPARATOR & FRACTIONATOR FOR THERMAL REFORMING

One (1) New 5'-6" ID x 61'-0" over-all height Bubble Tower made of 1¼" Plate and lined throughout with 5/64" and 7/64" thick, 11-13% Chrome stainless steel, type 405. Stainless steel support plates in place for 15 Trays, (Trays not included). Constructed in accordance with the API-ASME Code, stress relieved and radiographed. Designed for 400 PSI @ 750° F. Fabricated by A. O. Smith Corporation. Platform and ladder clips installed.

WOOD RIVER OIL & REFINING CO., INC.
335 West Lewis Street, Wichita, Kansas
Telephone 7-3325

WE CARRY THE LARGEST STOCK OF

New Parts for Civilian & Army Trucks

Winches, Steel Snatch Blocks, Pulleys, Heavy Duty Tools, and Equipment

Phone! Wire! or Write!
RING BROS.
Route 1 — Elizabeth, N. J.
Phone: ELizabeth 5-7800

EQUIPMENT FOR SALE

FOR SALE: No. 14 Armstrong, truck mounted, FORD Motors, V-Belt Drive, with 6″ tools and bailer. PRICE $2,000.00 cash. No. 25 Armstrong, trailer mounted, hard rubber, for deep drilling, jack shafts, for V-Belt drive, no motor, nor tools. Price $1,000.00 cash. Both machines have Bucyrus rubber tops for spudding. Write or phone Gray Well Drilling Co., Delafield, Wis.

FOR SALE: 1945 Sullivan #200 mounted on White truck. Contact James H. Green & Co., day phone 9884, P. O. Box 1465, San Angelo, Texas.

FOR SALE: New Beaird Packaged Compressor Plant with Ingersoll-Rand Type 6XVG 225 HP two stage gas compressor equipped with hand operated fixed volume pockets. Intake pressure range 100-200 PSI. Discharge pressure 1000 PSI. Capacity range 1,450 to 2,050 MCF. Ready to operate. Location Bishop, Texas, Box D-161, The Oil and Gas Journal, Tulsa, Oklahoma.

PACKAGED H_2S REMOVAL UNITS

We offer prompt shipment on skid-mounted hydrogen sulfide removal units for treating sour gas for pipe line or fuel gas purposes.

GRAFF ENGINEERING & EQ'PT. CO.
3415 Westminster, Dallas 5, Texas

DIESEL ENGINE FOR PIPE LINE

225 HP Busch Sulzer Model 3DF17, 360 RPM. 175 HP at 300 RPM. 3 cyl., 4 cycle, solid injection. Complete, late model. Excellent shape. $3200 f.o.b. St. Louis.

MISSISSIPPI VALLEY EQUIPMENT CO.
511 Locust St., St. Louis 1, Mo.

MACHINE TOOLS FOR SALE

5—Bullard Vertical Turret Lathes, 42″ tables. 5—Bullard two-head Maxi-mills, 42″ tables. All in first-class usable condition, complete with motors. Also other machine tools.

THE LOCOMOTIVE FINISHED MATERIAL CO.
Atchison, Kansas

Reconditioned Seamless Tubing

95,000 ft. 1½″ O.D.
120,000 ft. 2″ O.D.
55,000 ft. 2½″ O.D.
75,000 ft. 3½″ O.D.
80,000 ft. 4″ O.D.
21,000 ft. 5½″ O.D.

Single or Double Random Lengths—
Plain Ends
Beveled for Welding

Sonken-Galamba Corp.
2nd and Riverview (X-497) Kansas City 18, Kansas
Thatcher 9243

NEW
FRACTIONATING TOWER
REFLUX DRUM

One (1) New fractionating tower, 5′-0″ I.D. X 89′-6″ over-all height X 1⅛″ plate. Thirty-four (34) bubble trays, ten (10) 18″-300# manways. Stress relieved and built in accordance with API-ASME Code for 350 PSI working pressure.

One (1) new horizontal reflux drum, 5′-6″ I.D. x 18′-6″ over-all length x 1⅛″ plate. Stress relieved and built in accordance with API-ASME Code for 350 PSI working pressure.

ROCK ISLAND OIL & REFINING CO., INC.
335 West Lewis St. Wichita, Kansas
Phone 7-3325

EQUIPMENT FOR SALE

CASING

5,000 FEET 5½″ OD 15.50-pound seamless J-55 8-round, range 2 once run casing; 4,800 feet 5½″ OD 17-pound electric weld J-55 8-round, range 2 once run casing. Everitt-Whiting, Inc., 725 Wright Bldg., Tulsa, Oklahoma. 4-6082, 5-7051.

Several Army Surplus 4½″ x 6″ Gaso Duplex 1860 Pumps—two piece skid mounted with Chrysler 8 cylinder engines. Will sell pumps only or complete units about half price.

H. H. COFFIELD
ATTN: W. H. Orr
Phones: 132—Rockdale, Texas
A-66064—Houston, Texas

EQUIPMENT FOR SALE

FOR SALE: Failing "1500" portable rig for shot-hole, core, water-well, and shallow production drilling. Equipped with sand reel and bailer. Mounted on GMC truck. Rig and Truck in excellent condition. Rider & Montgomery, Box 523, Douglas, Wyoming.

FOR SALE

12—230 H.P. Type 10 Bessemer New 17″ Power Cylinders complete ready to run with 16″ to 18″ Compressors. 1—230 H.P. Clark Horizontal with Compressors. Located Salem, Illinois.

ENGLE PETROLEUM, Incorporated
Box 655, Evansville, Indiana

ALMOST NEW—DRILLING OR PIPE LINE ENGINE

Model RX1SV Le Roi 12-cylinder, 6¾″ Bore x 7″ Stroke, 3006 cu. in. displacement. Complete with Radiator, Starting Engine, Clutch and all latest accessories. Operated approximately 1,000 hours. Price $6,500.00.

LUCEY PRODUCTS CORPORATION
624 S. Cheyenne TULSA, OKLA. Phone: LD104

FOR SALE

Shot Hole Rig **Water Well Rig** **Core Rig**

National Type 1-D Drill; Hollow Kelly; Chain Pull Down; Mast 25′ 6″; With Gardner-Denver Model FXF Pump, Size 4½ x 5; Above mounted on 1946 Dodge WHA 46, 16,000# GVW, 2 Ton, 148″ WB; Sale Price $3,500.00

National Type 1-D Drill; Hollow Kelly; Chain Pull Down; Mast 25′ 6″; With Gardner-Denver Model FXF Pump, Size 4½ x 5; Above Mounted on 1942 Chevrolet Truck 1½ Ton, 160″ WB; Sale Price $2,500.00

THE ATLANTIC REFINING COMPANY
P. O. Box 2819
Dallas 1, Texas

NOW IN PROGRESS
OUR LATEST LIQUIDATION

100 OCTANE GASOLINE REFINERY
LOCATED AT COTTON VALLEY, LA.

EQUIPMENT IN UNUSUALLY FINE CONDITION

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SHREVEPORT, LA.
TELEPHONE: COTTON VALLEY 26

DULIEN STEEL PRODUCTS, INC.
of Washington
9265 E. MARGINAL WAY
LANDER 6000
SEATTLE 8, WASH.

EQUIPMENT FOR SALE

FOR SALE: Sullivan 300A drilling rig complete ready to move to job, terms to reliable party. Phone 6508 or 3996, P.O. Box 501, Abilene, Texas.

FOR SALE: Wilson-Snyder 12PLD pump, mud boat mounted, 48" 9 belt C section sheave, bargain, P. O. Box 324, Dallas, Texas.

FOR SALE: McKissick Tubing and Floor Blocks. Save 50%. Melton Supply Co., Seminole, Okla.

6000-FT. ROTARY RIG, diesel powered, complete with 4½" drill pipe, ready to drill. Near Alice, Texas. Full particulars and price, Wiegand Bros., Milam Bldg., San Antonio, Texas.

COMPLETE used generating plant GM twin diesel with 100 KW generator 3 phase 440 with switch board and voltage regulator. For quick sale. Damon L. Krumsick, Phone Mutual 247, Paola, Kansas.

O E M INDUSTRIES
Manufacturers
INDUSTRIAL GEARS & SPROCKETS, MACHINE PARTS OR COMPLETE ASSEMBLIES.
WE **Know How** TO PUT **Your Ideas** INTO PRODUCTION
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301 N. JUSTIN ST., DALLAS 11, TEXAS

REFINERY AND GASOLINE PLANT EQUIPMENT

(1) Vacuum tower, 5 ft. x 44 ft. 7 in. x ⅜ in., with 11 trays and pipe coil in bottom. $2500.
(1) Gasoline weathering tower, 3 ft. 6 in. x 50 ft. x ½ in., with four trays on 16 in. spacing; 200 lb. test with 2 ft. 4 in. x 10 ft. condenser on top. $1100.
(1) Pressure vessel—9 ft. 2⅞ in. x 41 ft. 3¼ in. x 1 7/16 in. thick, double riveted construction. $5000.
(1) Still, 6 ft. x 35 ft. x 1 in., dished heads, 200 lb. W.P. with 200 sq. ft. 2 in. pipe coil. $2500.
(6) 18,000 gallon casinghead gasoline storage tanks, 10 ft. x 30 ft. x ½ in., dished heads. $900 ea.
(5) 8,000 gallon casinghead gasoline storage tanks, 7 ft. x 30 ft. x 7/16 in., dished heads. $600 ea.
(5) Vessels, 3 ft. 6 in. x 10 ft. x ⅜ in., dished heads. $190 ea.
(1) Truscon Steel Building, 60 ft. x 186 ft., heavy fabricated structural steel and steel panel construction. With steel sash and door. $5580.

Above listings subject to prior sale.
Write—Wire—Phone
BROWN-STRAUSS Corporation
P. O. Box 78 Phone LD 169
Kansas City, Missouri

EQUIPMENT WANTED

WANTED to Buy—Used tanks and equipment suitable for a water flooding project in the Nowata area. Please give full description and price. Box D-171, The Oil and Gas Journal, Tulsa, Okla.

PIPE, Valves and Propane tank wanted: 3" and 4" pipe car load lots, no objection to internal corrosion and pitting, also Propane tank, also unloading compressor, also high pressure valves and cocks up to 3". Aylmer Trading Co., Aylmer, Ontario.

WANTED: One 250-hp., 3-stage, 500-psia. power and compressor unit. One 300-hp., 4-stage, 1,000-psia. power and compressor unit. Replying, give make, location, condition, power fuel, price. Box D-150, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED — One Gentry-Mitchell Boring Machine. Must be in good condition. Write Box 311, Bound Brook, New Jersey.

WANTED: One 300 or 400 HP Gas Engine Compressor Unit. Box D-163, The Oil and Gas Journal, Tulsa, Okla.

LEGAL BLANKS

BURKHART LEGAL BLANKS since 1908. Oil-Gas (all states), Business, Real Estate, Legal Forms, Leases, Revised With Government Regulations, Commercial Printing, Catalog and Samples on request. Burkhart Printing & Stationery Company, 115 South Cincinnati, Tulsa 3, Oklahoma.

HELP WANTED

MECHANICAL ENGINEER

Thorough university background followed by five or more years of outstanding achievement a definite requirement. Must have creative ability, a precision-technical mind. Men of less ability should not make inquiry. Salary commensurate with rigid requirements. A Missouri corporation. Correspondence confidential. Box D-160, The Oil & Gas Journal, Tulsa, Oklahoma.

GEOPHYSICIST

A well established, major geophysical company wishes to employ a highly qualified party chief. The individual must have a college degree, a minimum of 2 years actual experience as a party chief, and be willing to move with the seismic party. This is a solicitation for a man of outstanding caliber who has the capacity to advance in a company with a high regard for its present good reputation. Give age, education, experience, salary expected, references, and all other appropriate details in first reply. Our employees know of this ad. All replies will be treated confidentially. Reply to Box D-144, The Oil and Gas Journal, Tulsa, Oklahoma.

HOUSTON DISTRICT Sales Engineer: Engineer familiar with pumps, compressors, exchangers, etc., having sold this type of equipment in Texas for at least the last 3 years to refinery, gasoline plant, and pipe-line companies. Replies confidential. Box D-117, The Oil and Gas Journal, Tulsa, Oklahoma.

ENGINEERS, Executives, Technical Men: Salaried positions—$3600 to $30,000. This confidential service for outstanding men who desire a change of connection, will develop and conduct preliminary negotiations without risk to present position. Send name and address for details. Tomsett Associates, 1204 Berger Bldg., Pittsburgh 19, Pa.

NEW foreign and domestic Oil Employment Directory. Over 500 listings in drilling, production, refining, natural gasoline, pipe lines, geological, exploration, supplies, manufacturers, services; and trucking, refinery and pipe line contractors, showing where to apply for jobs. Price $5.00. Oil Industry Mailing List, Box 2603, Tulsa, Okla. (Our 28th year).

WANTED: Oil treating engineer, headquarters Oklahoma City, to establish company-wide treating methods, 12 states. Includes instruction of company personnel. Must have at least three years oil production treating experience. State full particulars Address Personnel Department, Sohio Petroleum Company, First National Building, Oklahoma City, Oklahoma.

CORROSION MAN

Must have broad thorough technical education, not less than five years of successful experience. Requirements stiff, Salary in keeping with ability. Box D-159, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED

Midwestern manufacturer seeks man with engineering background experienced in the sale of equipment to the oil industry. Familiarity with internal combustion engines desirable. State qualifications, age, and compensation required in first letter. Write
Box D-148, The Oil and Gas Journal, Tulsa, Oklahoma

WANTED

EXPERIENCED SALESMAN

We aren't looking for any geniuses. But the men we do want and need are not just ordinary "peddlers."

The few men we want to find are experienced salesmen of oil field equipment. They are used to making good money on a straight commission and drawing account.

They would want to work for a nationally known firm—and feel that the future was secure. If you are one of these men—or his friend—your inquiry in confidence should be sent to:

BOX D-166

THE OIL AND GAS JOURNAL

Tulsa, Oklahoma

HELP WANTED

RESIDENT ENGINEER, refinery or gasoline plant construction. Immediate employment. Box D-133, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOLOGIST with current or recent active experience in West Texas wanted for geological department of independent oil company located in Midland, Texas. Excellent opportunity for man under forty years age who can organize, direct and administer all phases of an aggressive geological program leading to the development of production. Personal interview may be arranged based on merit indicated by a written outline of past experience and training. All replies will be handled in confidence, and should include date of availability and starting salary desired. Recent photo or snapshot would be helpful. Address: Box D-129, The Oil and Gas Journal, Tulsa, Oklahoma.

CONSTRUCTION MEN

Welders, Ditch and other inspectors. Salary and flat expense allowance. Box D-137, The Oil and Gas Journal, Tulsa, Okla.

FOR large company operating throughout Mid-Continent and Rocky Mountain states. Contract man with land experience and knowledge of operations. Excellent opportunity. Please state education and experience. Inquiries confidential. Box D-167, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: Associate Professor of Petroleum Engineering — part-time research. Graduate work and industrial experience required. Reply Box D-145, The Oil and Gas Journal, Tulsa, Oklahoma.

SITUATIONS WANTED

DRAFTSMAN experienced layouts in plan and section of process piping, methods fabricating piping, and layout and detailing mechanical equipment. Age 26, some college, willing relocate, write Box 314 Far Rockaway, N. Y.

INDEPENDENT oil operator desires connection as land man; close deals. Age 38. Experienced all phases oil industry. Available about 30 days; anywhere. Box D-131, The Oil and Gas Journal, Tulsa, Oklahoma.

PETROLEUM Engineer, B.S., 31, 6 years experience in drilling, production, and reservoir engineering, desires change to smaller company. Executive ability; capable of supervising production, drilling, and engineering. Box D-174, The Oil and Gas Journal, Tulsa, Oklahoma.

ENGINEER-SUPERINTENDENT — M.S. in Ch.E., age 35, registered Texas engineer, thorough knowledge refining, nine years varied experience engineering and plant supervision, most recently manager small refinery, available at once due to plant shut down. Write WRS, Box 112, Winnsboro, Texas.

EXPERIENCED GRADUATE MECHANICAL ENGINEER wants connection which may require any of the following qualifications: Oil field equipment sales—Experience in leasing, drilling and producing oil wells—10 years field and executive experience with nationally known service companies. Box D-142, The Oil and Gas Journal, Tulsa, Oklahoma.

PETROLEUM engineer, 33, married, B.S., 7 yrs. experience. Qualified to supervise drilling, production, or reservoir work. Box D-149, The Oil and Gas Journal, Tulsa, Oklahoma.

INDUSTRIAL TRAINER

Fifteen years industrial training with major oil companies — sales, manufacturing and production. AB and MS Degrees. For personnel director or training director. Box D-154, The Oil and Gas Journal, Tulsa, Oklahoma.

TOP Piping Designer. Hi-pres. etc. Many years oil experience. Age 42. BSChE. Registered mechanical engineer. Box D-169, The Oil and Gas Journal, Tulsa, Oklahoma.

REFINERY Engineer for re-rating equipment; vessel, piping, miscel. design. Age 41. Registered ME and ChE. Box D-170, The Oil and Gas Journal, Tulsa, Oklahoma.

PETROLEUM Engineer: B.S. Desires position with active company in Mid-Continent. Seven years experience in all phases production engineering including completions, work-overs, production problems and secondary recovery. Qualified for production job. Box D-173, The Oil and Gas Journal, Tulsa, Oklahoma.

SITUATIONS WANTED

PETROLEUM CHEMIST: Age 31, eight years experience special physical inspections and chemical analyses associated with petrochemical research, new product development, and refinery process service, including staff supervision. Familiar with refinery control tests. Engineering degree background. Box C-855, The Oil and Gas Journal, Tulsa, Oklahoma.

LADY with extensive oil and legal experience, secretarial and office management, desires work with independent oil company P.O. Box 2273, Casper, Wyoming.

PETROLEUM Engineer, B.S. Age 28, four years production and reservoir experience major company; desires permanent location north or east. Box D-147, The Oil and Gas Journal, Tulsa, Oklahoma.

LEASE AND DRILLING BLOCKS

FOR SALE: Oil and Gas Leases and drilling propositions in shallow territory of Allen, Simpson, and Warren Counties, Kentucky. W. P. Harley, Bowling Green, Ky.

WILL BUY gas or oil production, large or small. Prefer properties with some undeveloped acreage. Might consider drilling deals. Box D-172, The Oil and Gas Journal, Tulsa, Okla.

WILL BUY oil leases anywhere, large or small blocks if any likelihood of oil field or good geology, provided you co-operate in furnishing all necessary information. Write fully what you have. Box 2153, Denver, Colo.

HAVE 2,800-acre block with one small well. Ellenburger production at 3,400 ft. New Pumping Unit, Tanks, Tubing, and Rods. Located in Comanche and Erath Counties, Texas. Contact C. O. Taylor, 1110 10th St., Lubbock, Texas.

WANTED to buy settled production sand wells. Preferably Illinois, Indiana, Kentucky. Will consider 40 or 50 barrels a day in Oklahoma, Kansas, or Texas. Gardenhire Brothers, Inc., Box 351, Bartow, Florida.

NEW MEXICO OIL FIELDS

OPERATORS, LEASE & ROYALTY BUYERS. Royalty close to production in famous Cross Road Field, also Leases & Royalty on Important potential Oil Structure. Maps & Data on request.

W. J. PETERMAN, Geologist
Portales, New Mexico

LEASES ROYALTIES

PRODUCING OR NONPRODUCING

Texas, New Mexico, Oklahoma, Louisiana and Illinois

Inquiries Invited

B. D. BUCKLEY

60 Broadway Drive, Clayton (5), St. Louis, Missouri

NORTH DAKOTA MINERALS

Bought direct for you on purchase order. I am thoroughly familiar with this play. Wire, call or write

JOHN ALLEN
806 Clarence Parker Hotel
Minot, North Dakota

(Member National Oil Scouts and Landmen Association. References exchanged.)

PATENT ATTORNEYS

PATENT Practice before U. S. Patent Office. Validity and Infringement Investigations and Opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommell, Registered Patent Attorneys, Suite 418, 815-15th Street, N.W., Washington 5, D. C.

ROYALTIES

DEEDED ROYALTIES
San Juan Basin & Permian Basin. Write Harry S. Wright, Wright Bldg., Farmington, New Mexico.

ROYALTIES IN HOT AREAS!
Recent strikes have focused attention on Montana's deeper oil zones and major companies are moving fast, drilling and leasing. We buy direct in the field, sell direct to our customers. Write LANDOWNERS ROYALTIES COMPANY, Box 1225, Great Falls, Montana.

CASH MARKET for PRODUCING ROYALTIES
ROBERT L. KINKAID
World Bldg. Tulsa, Oklahoma

BUSINESS OPPORTUNITIES

WE WILL FURNISH brand new seamless casing, tubing and line pipe, in exchange for interest in good oil production. Give us details of your production.

VALLEY STEEL PRODUCTS CO.
124 Sidney Street, St. Louis 4, Mo.

FOR SALE

MERCURY
Pure grade, .0000% non volatile residues. Each lot tested for purity before packaging. Packed in 1, 5 & 10 lb. glass containers. For prices & terms address H M Co., P. O. Box 6012, Dept. O, Kansas City, Mo.

INDICATOR: Locates buried money and mineral deposits, price $20.00. Electrical instruments for locating oil and gas are not for sale. Horton's Surface Geological Oil Survey, Belle River, Ill.

WANTED

WILL PURCHASE
ICC MOTOR CARRIER'S CERTIFICATE OR PERMIT

I represent corporation which desires to purchase validly existing, transferable Interstate Commerce Commission Motor Carrier's Certificate or Permit authorizing the transportation for compensation of machinery, equipment, materials and supplies used in, or in connection with, the discovery, development, production, refining, manufacturing, processing, storage, transmission and distribution of natural gas, and petroleum and other products and by-products, and supplies and articles the transportation of which because of their size or weight require the use of special equipment or handling, in and through the states of Illinois, Indiana, Kentucky, Missouri, Arkansas, Kansas, Ohio, Oklahoma, Texas and Louisiana. Please give full information as to date of certificate or permit, territory covered and authority as to articles and items covered thereby, and price asked.

EDWARD W. TOBIN
Suite 911-912 Commerce Building,
418 Olive Street,
St. Louis 2, Missouri.
Telephone—CHestnut 4759

EQUIPMENT MEN

(Continued from page 117)

Frye to Manage Republic's New Dallas District Office

E. M. Frye has been appointed manager of the newly created Dallas district sales office, according to Don L. Collins, executive vice president and general manager of sales for Republic Supply Co. This new position will place Frye in charge of the Fort Worth area as well as the area previously served by the Dallas office.

Frye has been with Republic Supply since November 1943, serving until now as field representative in Dallas.

Price Installs Somastic Plant at New Orleans

A complete Somastic coating plant has been installed south of New Orleans on the Intra-Coastal Canal, by H. C. Price Co. This permanent plant will afford Somastic pipe-coating facilities for corrosion protection throughout the Gulf States area for all pipe sizes up to and including 30 in. in diameter.

The yard has ample space for stockpiling bare and coated pipe and is conveniently located for rail and marine transportation. Equipment will be installed to manufacture and apply concrete over Somastic coating for weight and additional protection to the pipe in marine and swamp installations. Pipe will be cleaned by the steel grit shotblasting method.

Robert P. "Bob" White has been appointed Gulf Division manager in charge of sales and coordination of Somastic operations with headquarters at New Orleans. White has been associated with Somastic coating operations since 1940.

During 1946 he was superintendent of field operations in Pennsylvania and New York, after which he was transferred to the head office at Bartlesville as administrative manager of the Somastic division.

Roberts Is Sales Manager Of Birmingham Tank Co.

GEORGE ROBERTS

George Roberts has been appointed sales manager of Birmingham Tank Co., division of Ingalls Iron Works Co. This appointment fills the vacancy created by the resignation of J. W. Billings.

Roberts, who attended University of Georgia, is reassociating with the firm. He had previously been assistant sales manager for the same company.

Rhodes to Distribute Globe Steel Fittings

Globe Steel Tubes Co., Milwaukee, has appointed John A. Rhodes Co., Inc., Springfield, Mo., as a distributor of Globe seamless welding fittings and flanges. A complete line of fittings and flanges will be stocked ranging in size from ½ to 24 in. in diameter.

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CALENDAR

August

United Nations Scientific Conference on the Conservation and Utilization of Resources, U. N. Interim Headquarters, Lake Success, N. Y., August 17-September 6.

September

Interstate Oil Compact Commission, summer quarterly meeting, Stanley Hotel, Estes Park, Colo., September 1-3.

American Institute of Chemical Engineers, Mt. Royal Hotel, Montreal, September 6-9.

Pacific Coast Gas Association, fifty-sixth annual convention, Santa Barbara, Calif., September 7-9.

Instrument Society of America, annual meeting and exhibit, Municipal Auditorium, St. Louis, September 12-16.

National Petroleum Association, Hotel Traymore, Atlantic City, N. J., September 14-16.

American Chemical Society, 116th national meeting, Atlantic City, N. J., September 18-23.

American Association of Oilwell Drilling Contractors, ninth annual meeting, Baker Hotel, Dallas, September 19-21.

National Butane-Propane Association, Jefferson Hotel, St. Louis, September 19-21.

Mid-Continent Oil and Gas Association twenty-seventh annual convention, Louisiana-Arkansas division, Roosevelt Hotel, New Orleans, September 22-23.

American Institute of Mining and Metallurgical Engineers, regional meeting, Nell House, Columbus, Ohio, September 25-28.

American Society of Mechanical Engineers, fall meeting, Erie, Pa., September 25-30.

October

Independent Petroleum Association of America, Texas Hotel, Fort Worth, October 2-4.

American Society of Mechanical Engineers, petroleum division, 1949 Petroleum Mechanical Engineering Conference, Biltmore Hotel, Oklahoma City, October 2-5.

National Association of Corrosion Engineers, South-Central Regional Division, annual meeting, Adolphus Hotel, Dallas, October 3-4.

National Lubrication Grease Institute, Hotel Roosevelt, New Orleans, La., October 3-5.

American Institute of Mining & Metallurgical Engineers, Petroleum Branch, fall meeting, Plaza Hotel, San Antonio, October 5-7.

California Natural Gasoline Association, Ambassador Hotel, Los Angeles, October 7

American Association of Petroleum Geologists, regional meeting, Buena Vista Hotel, Biloxi, Miss., October 12-14.

Symposium on Instrumentation for the Process Industries, fourth annual session, School of Engineering, Texas A. & M. College, College Station, Tex., October 12-14.

American Society for Testing Materials first Pacific area national meeting, Hotel Fairmont, San Francisco, October 10.

Texas Mid-Continent Oil and Gas Association, annual meeting, Rice Hotel, Houston, October 13-14.

Oil Progress Week, October 16-22.

American Gas Association, annual convention, Chicago, October 17-20.

American Institute of Mining & Metallurgical Engineers, Petroleum Branch, fall meeting, Elk's Club, Los Angeles, October 20-21.

Independent Natural Gas Association of America, annual meeting, Baker Hotel, Dallas, October 31.

November

Society of Automotive Engineers, diesel, Chase Hotel, St. Louis, November 1-2.

Society of Automotive Engineers, fuels and lubricants, Chase Hotel, St. Louis, November 3-4.

NOMADS

Houston Nomads, second Monday of each month, Ye Ole College Inn, Houston.

Los Angeles Nomads, second Wednesday each month, Jonathan Club.

Petrochemistry Progress Is Being Studied

(Continued from page 23)

sulfates which are obtained by cracking petroleum wax and treating the resulting olefins with sulfuric acid.

The subject of synthetic production of liquid hydrocarbons also was given attention at the oil chemistry session. Dr. Ing. S. Landa, of the Czech Institute of Higher Learning, Prague, said that the manufacture of synthetic fuels is indispensable for countries which possess no crude oil reserves. The price differential heretofore existing between crude petroleum and synthetic products is small and further narrowing of this differential is possible through simplifying the installations, automatic control, improvement of thermal efficiency, and exploitation of all byproducts from the processes.

The Czech scientist pointed out that for the majority of countries, coal is given first consideration as the raw material for the synthetic production of liquid fuels. He reviewed some of the work done on coal synthesis processes and mentioned that the original German technique lagged far behind the mechanization which has been since achieved in the United States.

Another paper on this subject was by R. Holroyd, Imperial Chemical Industries, Ltd., Billingham, England. Speaking on "The Flexibility of the High Pressure Hydrogenation Process for Liquid Fuel Production," he showed that the processes for the production of synthetic fuels vary considerably in the choice of starting materials which they allow and in the control of the type and quality of fuels produced.

The program to expand the petroleum refining industry in the United Kingdom was outlined in another discussion by F. Mackley, Shell Refining & Marketing Co., Ltd., Stanlow refinery, Cheshire. He said it appears quite definite that projected expansion will lift capacity from the prewar level of about 4,500,000 tons to about 20,000,000 tons by about 1953 and that further addition of some 8,000,000 tons may be expected if projects not included in the British Government's plans are developed.

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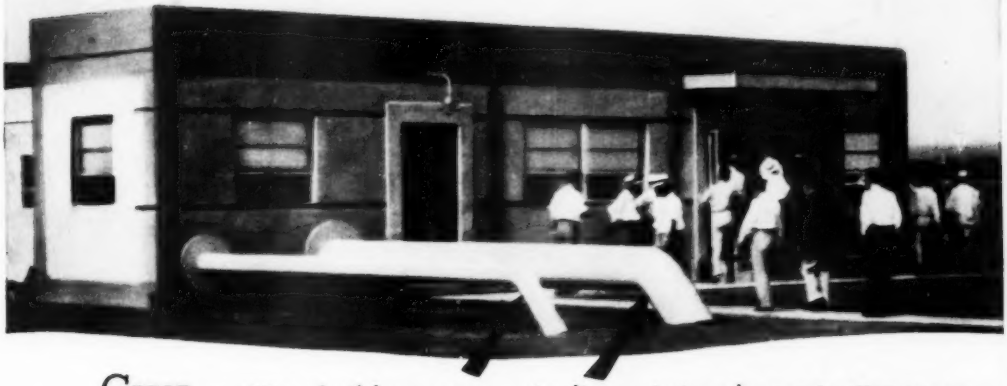
Side-By-Side after 32 years



GREAT quantities of oil have gone through the pumps in the last 32 years--and there is a lot more to come. The above illustration shows a $10^{3}/_{4}$" line built in 1917 and its new companion 22" line in the Ozark system, terminating at Wood River, Ill. Line pipe for both these projects was furnished by Youngstown and we are proud to have played a part in the completion of the new as well as the old.

The Basin and Ozark system is the largest privately financed oil line ever constructed. Faith in the economic future of our country is represented by this venture. Many other pipe line projects under construction or contemplated reflect this same faith. In our present economy tomorrow's oil and tomorrow's gas are of increasing importance to all.

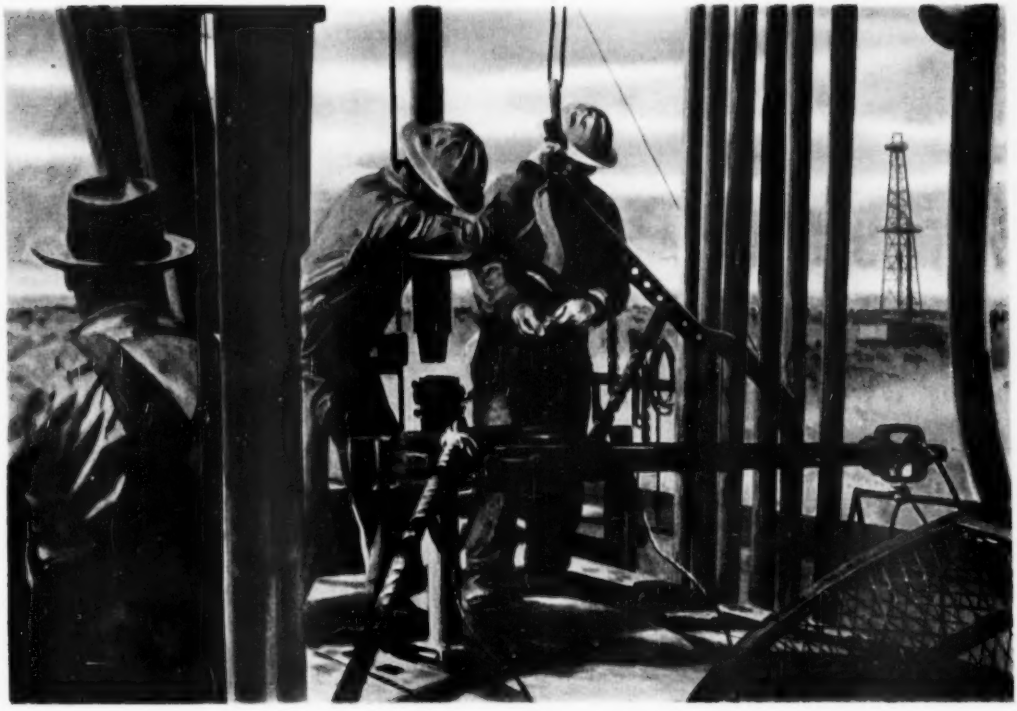
Youngstown line pipe means long lengths, ease of bending, ease of welding, speed in laying--the result of know-how developed in almost 50 years of pipe production. Remember, if it is Youngstown--it's good.

THE YOUNGSTOWN SHEET AND TUBE COMPANY General Offices — Youngstown 1, Ohio

Manufacturers of Carbon, Alloy and Yoloy Steel Export Office - 500 Fifth Avenue, New York

PIPE AND TUBULAR PRODUCTS - COLD FINISHED CARBON AND ALLOY BARS - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - WIRE - CONDUIT - RODS - SHEETS - PLATES - BARS - RAILROAD TRACK SPIKES.

DOUBLE THE VALUE OF YOUR TOOL JOINT



The rugged design of the Hughes Flash-Weld construction assures tool joint performance of longer life, with greater dependability at tool joint to pipe connection. The unitized construction affords trouble-free fusion of tool joint and pipe . . . automatically eliminates such pipe end troubles as last-engaged-thread failure. Hughesite hardfacing, heavily applied on the O. D. and tapered shoulder of the one-piece Flash-Weld tool joint, retards abrasive external wear and undercutting. This is another Hughes "Engineered Solution" . . . providing double-barreled drilling duty for your drilling dollar.

HUGHES TOOL COMPANY
HOUSTON, TEXAS

Standard of the Industry